The Business Magazine for Makers & Users of Chemicals
Management, Research, Production, Marketing

# CHEMICAL INDUSTRIES

## Contents

Volumn 47 Number 7

DECEMBER, 1940





★

Published monthly, except twice in October, and entered as 2nd class matter Dec. 22, 1934, at the Post Office at New Haven, Conn., under the Act of March 3, 1879. Subscription, Domestic, $3 a year; Canadian and foreign, $4. Single copies, 35 cents. Copyrighted, 1939, by Trade and Technical Papers, Inc., 522 Fifth Avenue, New York, N. Y., Murray Hill 2-7888; Chicago: 919 North Michigan Avenue, Whitehall 5842; London: 2 Cockspur Street, S. W. 1, Whitehall 6642 — Donald Hunter.

The Business Magazine for Makers & Users of Chemicals
Management, Research, Production, Marketing

CHEMICAL INDUSTRIES



# Contents

Volumn 47 Number 7

## DECEMBER, 1940

### Editorial



### Feature Articles



### Plant Operation and Management



### Chemical Specialties



### New Chemicals for Industry



### News of the Month in Review



### Part 2: Statistical and Technical Data Section



★

Published monthly, except twice in October, and entered as 2nd class matter Dec. 22, 1934, at the Post Office at New Haven, Conn., under the Act of March 3, 1879. Subscription, Domestic, $3 a year; Canadian and foreign, $4. Single copies, 35 cents.  522 Fifth Avenue, New York, N. Y., Murray Hill 2-7888; Chicago: 919 North Michigan Avenue, Whitehall 5842; London: 2 Cockspur Street, S. W. 1, Whitehall 6642 — Donald Hunter.

# Black Gold!

*Suppose someone who lived forty or fifty years ago — say one of the founders of Mathieson — could pay us a visit today. And suppose we could have the pleasure of showing him the sights of 1940, of explaining the vast changes that have taken place since the turn of the century. What do you think would amaze the old gentleman most? If he were one of the pioneers who founded Mathieson, we believe he would be most interested in the revolutionary changes wrought by chemical progress and in the part his successors have played in building the present-day America. We would go about telling him the story as we tell it in this series of advertisements.*

**● You look astonished, Mr. M., as well you may. Petroleum's importance was only beginning to be appreciated in your day. You could not foresee the time when it would be one of the prime essentials of industrial civilization, and nations would put a far higher value on the possession of oil fields than on deposits of gold or diamonds.**

**The story of oil is the story of our whole modern industrial age — a drama of gigantic growth and development. In the refining end of this great petroleum industry, Mathieson Chemicals play an important part — caustic soda and soda ash as treating reagents, bicarbonate of soda for fire-foam systems, ammonia for refrigeration and for combatting corrosion of equipment, chlorine and hypochlorite for sweetening distillates, for water treatment and for general sanitation. Thus Mathieson products, you'll be proud to know, are contributing in many ways to the continuing development of petroleum in its ever widening service to this nation's industrial life.**

# MATHIESON CHEMICALS

SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . ANALYTICAL SODIUM CHLORITE

**THE MATHIESON ALKALI WORKS (INC.)**
**60 E. 42ND STREET, NEW YORK, N. Y.**

# The Reader Writes—

***Fact, Not Propaganda***

The September issue of CHEMICAL INDUSTRIES carried excerpts from letters from some of our British friends. The following may be of interest, if only to indicate what they are telling each other—fact, not propaganda.

Recently, the Managing Director of a large British chemical group for whom I act as consultant came to America for the purpose of purchasing considerable American equipment. A letter, *to him*, from the Secretary of his company, was turned over to me because of various data it contained. Among non-technical items was the following:

"Thanks for your enquiry about the staff. Nobody pays any attention to daylight raids and we do not even go down to our shelter in the basement. I understand the same is the practice with most business and private houses. The bomb that went off near Buckingham Palace was a time bomb and went off, so far as I remember, one afternoon about 2:30, when everybody was at work. It was just a big thud which made people sit up for a fraction of a second, and then work proceeded as usual.

"We stop work a little earlier in the afternoon to enable us all to get home early and have an evening meal in peace before the night raids start."

*Editorial Note*: The above letter was received from a well-known New York chemical consultant with the request that his name be withheld.

***All Subscribers Receive It***

We have received your recent literature on the new 1940-41 edition of the Buyer's Guidebook.

While we cannot at this time, due to company policy, renew our subscription in order to obtain a copy of the Guidebook, we would appreciate receiving a copy. Our last subscription expiring in June, 1941—covered by our purchase order number RL-11417—will be renewed at that time and so far as we know will be renewed from year to year.

For the above reason we would like to know your reaction to our receiving a copy. The book is frequently consulted by our research associates and has been very helpful in the past.

J. P. FULLERTON, *Chief Clerk*,
Research Laboratories,
Carnegie-Illinois Steel Corporation,
Pittsburgh, Pa.

I'm getting your magazine regularly, but have not received this year's issue of Chemical Industries Buyer's Guidebook, which I believe was published in October. This Guidebook is of the utmost importance to me, and I refer to it constantly. Please see that I get a copy of it.

W. L. CUMMINGS, *Consultant*,
Syracuse, N. Y.

*Editorial Note*: Every subscriber to CHEMICAL INDUSTRIES receives a copy of the Buyer's Guidebook Number. We are informed by our printers that all copies for subscribers have been mailed.

***Improving the Patent Digest***

I would suggest that you include the class numbers in the United States Patent List. This would make possible the filing of abstract cards under the class number.

HOWARD A. WHITTUM, *Chemist*,
United States Envelope Co.,
Worcester, Mass.

***Briefs From the Editor's Mail***

George S. Squibb, Jr., E. R. Squibb & Sons, asks "Why not a little more financial and business material"?

Louis Weisberg of New York City offers the suggestion of providing separate classification for patents relating to electrochemistry.

E. L. Marsiglio of the New Products Division of Merck would like more articles on raw materials such as ores, minerals, etc. (*Editorial Note*: Yet to come in the popular Raw Material Series are articles on bauxite, salt, lime, etc.).

R. W. Deraczynski of the Chemical Research Laboratories, New York City, would like more articles on chemical specialties in various fields, similar to "Automotive Chemical Specialties" in the February, 1940, issue.

## CALENDAR OF EVENTS

**December**

**Dec. 11,** Salesman's Assoc. of the American Chemical Industry, Luncheon Meeting, Chemists Club, New York City.
**Dec. 11-15,** National Chemical Exposition, Stevens Hotel, Chicago, Ill.
**Dec. 19,** Chicago Drug & Chemical Ass'n., Annual Christmas Stag, Morrison Hotel, Chicago, Ill.
**Dec. 19,** Salesman's Assoc. of the American Chemical Industry, Annual Christmas Party, Hotel Edison, New York City.
**Dec. 26-28,** American Physical Society, Philadelphia, Pa.

**January**

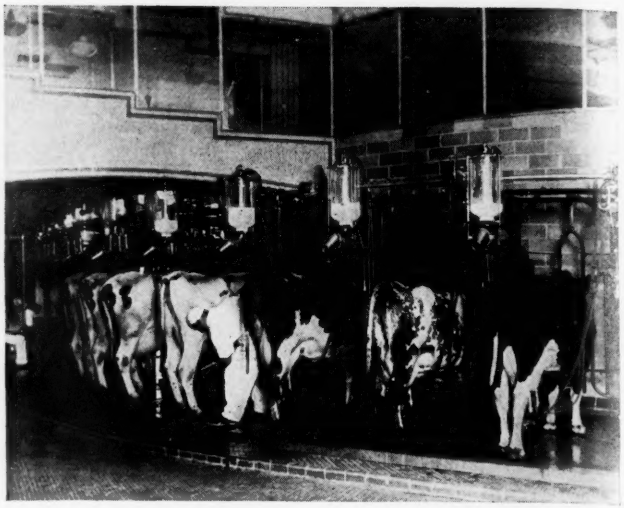
**Jan. 6-10,** Society of Automotive Engineers, Annual Meeting, Book-Cadillac Hotel, Detroit, Mich.
**Jan. 10,** American Chemical Society, N. Y. section joint meeting with Society of Chemical Industry in charge, Perkin Medal, New York City.
**Jan. 11,** Association of American Soap and Glycerine Producers, Annual Meeting, Waldorf Astoria Hotel, New York City.
**Jan. 13-14,** American Society for Testing Materials, Committee A-1 on Steel, Hotel Warwick, Philadelphia, Pa.
**Jan. 13-16,** Refrigeration Service Engineers Society, 7th Annual Convention, Stevens Hotel, Chicago, Ill.
**Jan. 15-18,** American Society of Civil Engineers, Annual Meeting, New York City.
**Jan. 16,** Louisville Paint & Varnish Production Club, Brown Hotel, Louisville, Ky.
**Jan. 16-17,** Liquefied Petroleum Gas Assoc., Inc., Eastern Section Meeting & Exhibit, New York City.
**Jan. 17-18,** N. Y. State Sewage Works Association, Annual Meeting, Hotel McAlpin, New York City.
**Jan. 20-21,** Compressed Gas Manufacturers Ass'n., Inc., Annual Meeting, Waldorf Astoria Hotel, New York City.
**Jan. 21,** Oil Trades Association of New York, Quarterly Meeting & Dinner, Waldorf-Astoria Hotel, New York City.
**Jan. 25,** National Association of Purchasing Agents, Executive Committee Meeting, Chicago.

**February**

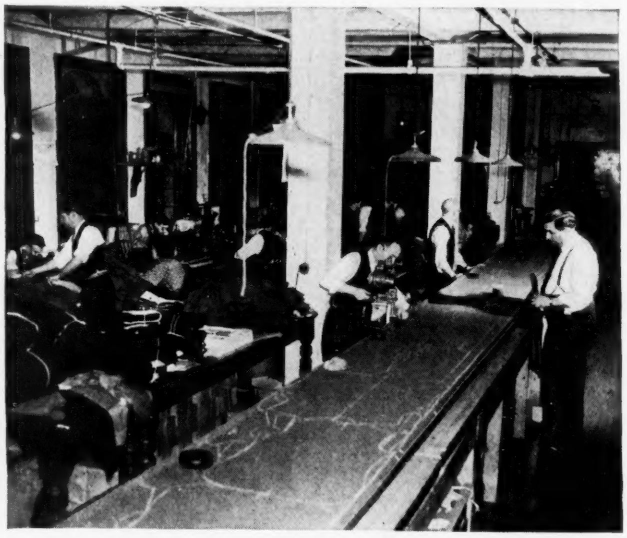
**Feb. 7,** American Chemical Society, New York Section.
**Feb. 12,** Gypsum Association, Annual Meeting, Palmer House, Chicago, Ill.
**Feb. 17-20,** American Paper and Pulp Assoc., Annual Convention, The Waldorf Astoria Hotel, New York City.
**Feb. 17-20,** Technical Assoc. Pulp & Paper Industry, Annual Meeting, Roosevelt Hotel, New York City.


BICHROMATE OF SODA
BICHROMATE OF POTASH
Mutual
MUTUAL CHEMICAL CO. OF AMERICA
MUTUAL
NEW YORK, N.Y.
Bichromates
Mutual Chemical Co. of America
270 MADISON AVENUE, NEW YORK
BICHROMATE OF POTASH

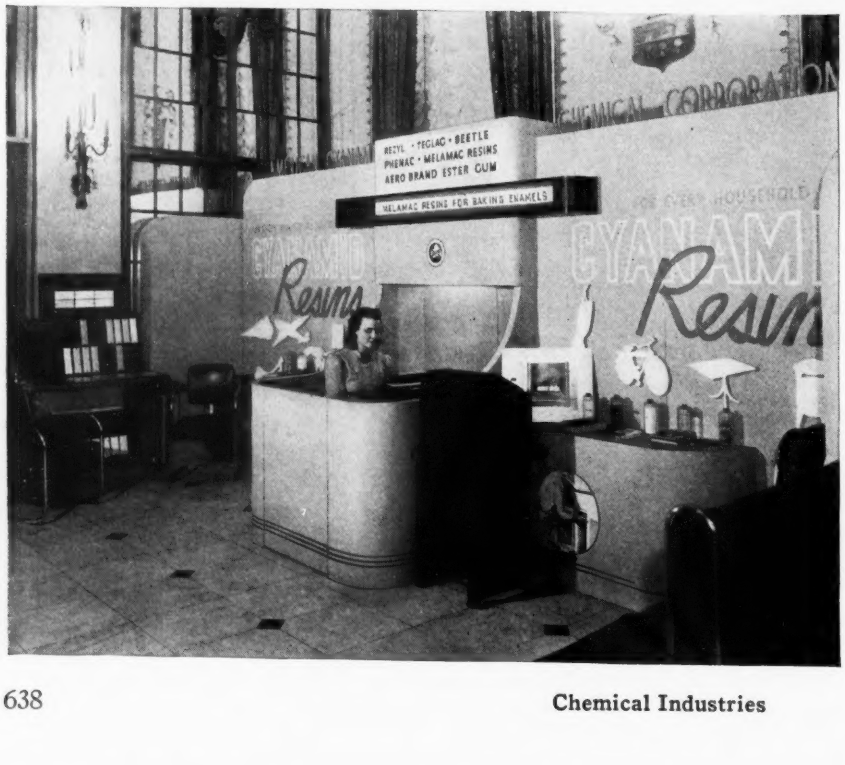
# Life ON THE CHEMICAL NEWSFRONT



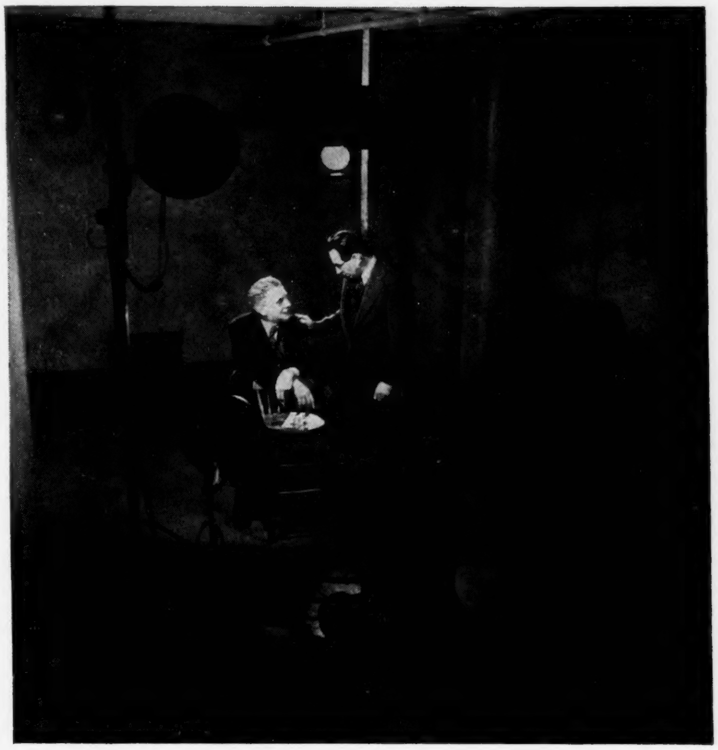
(*Above*) **HIGHER MILK YIELD** and faster growth may result when cows are fed on a diet containing urea, it is indicated by recent investigations. The urea provides a source of essential nitrogen, and may be used to replace part of the protein ordinarily required.



(*Above*) **KHAKI UNIFORMS** for first U.S. peacetime conscript army, are carefully made to meet rigid inspection. Photo shows set-up for straight-line production at the plant of E. Schwarz Company. In dyeing of government shades on wool, Calcochrome Yellow CGW supplies the yellow component with complete satisfaction, offers advantages of flexibility and economy. And for mineral khaki shades to meet government specifications in dyeing of canvas and other fabrics, Cyanamid offers Black Iron Liquor and Acetate of Chrome. Complete information on these products is available on request.




(*Left*) **RESINS FOR PAINTS** were featured at the Cyanamid booth at the Paint Industry Show recently held in connection with the 52nd Annual Convention of the National Paint, Varnish and Lacquer Association. Cyanamid's line of products for the paint industry has been expanded by the production of MELAMAC* Resins. Baking enamels formulated with MELAMAC Resins show striking advantages in speed of cure, hardness, gloss and color retention at high temperatures, outdoor durability, chemical stability.



(*Above*) **SCULPTRESS OF TIRE TREADS** is the unique occupation of Miss Chloe De Long, shown with one of her tire models. Every tire design made by Firestone is first modeled by Miss De Long, as a prelude to executive approval before the design is released for production.

(*Above*) **PHOTOGRAPHIC USERS** of Red Prussiate of Potash now have a domestic source of supply in Cyanamid's REDSOL** CRYSTALS, (Potassium Sodium Ferricyanide) which replace the imported product in all uses—with a saving in amount needed.

(*Above*) **NEW PLANT ADDITIONS** at Cyanamid's Kalamazoo Plant give extra capacity for the production of wax sizes and casein. Located in the heart of Michigan's paper manufacturing area, the new units provide a convenient source for these widely used paper chemicals.

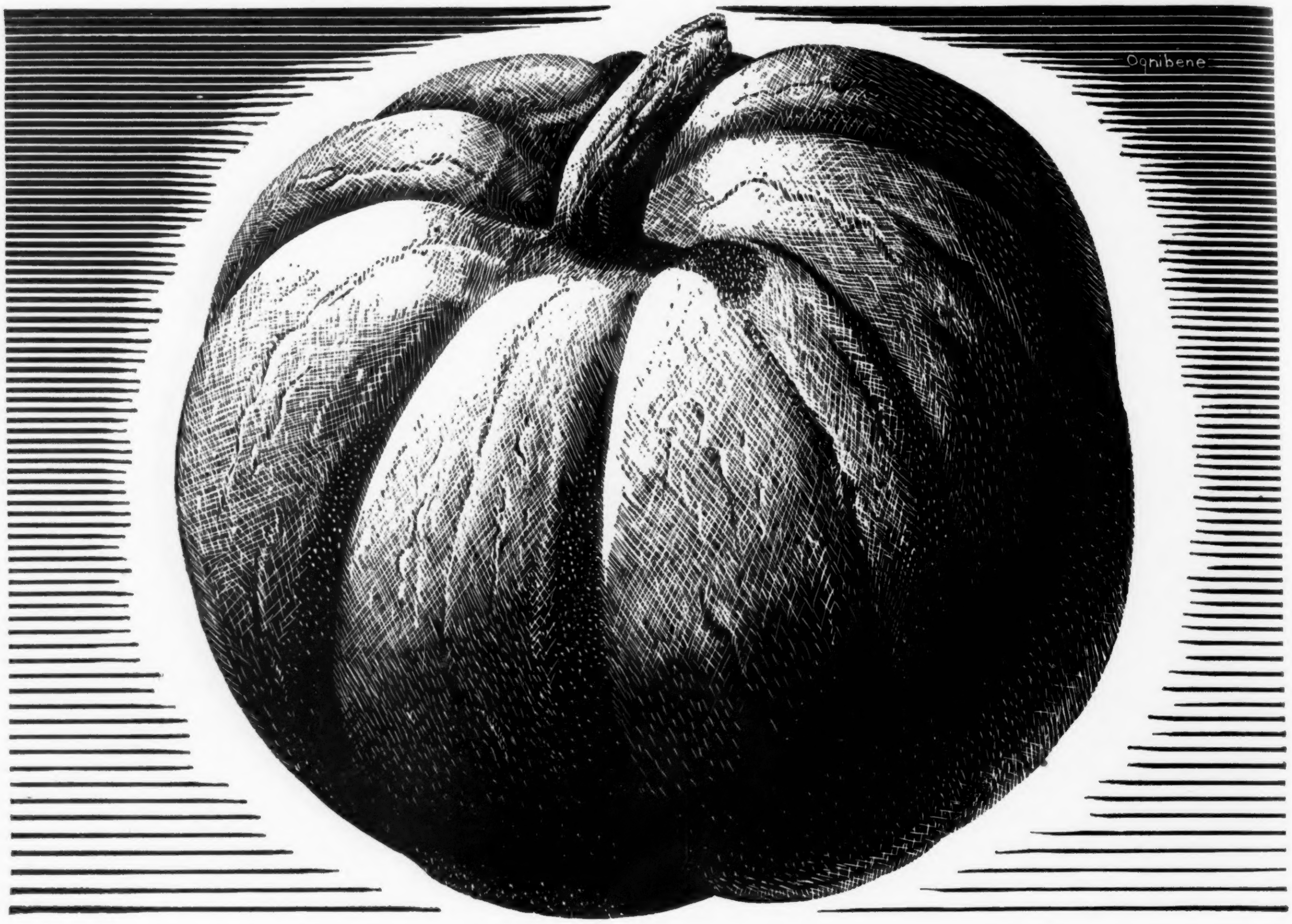

(*Above*) **CHRISTMAS SEASON** brings its annual boom in the toy industry, and with it an increased demand for chemicals. With its wide use of paints, leather, rubber, and plastics, the toy industry is indirectly a major consumer of chemicals.

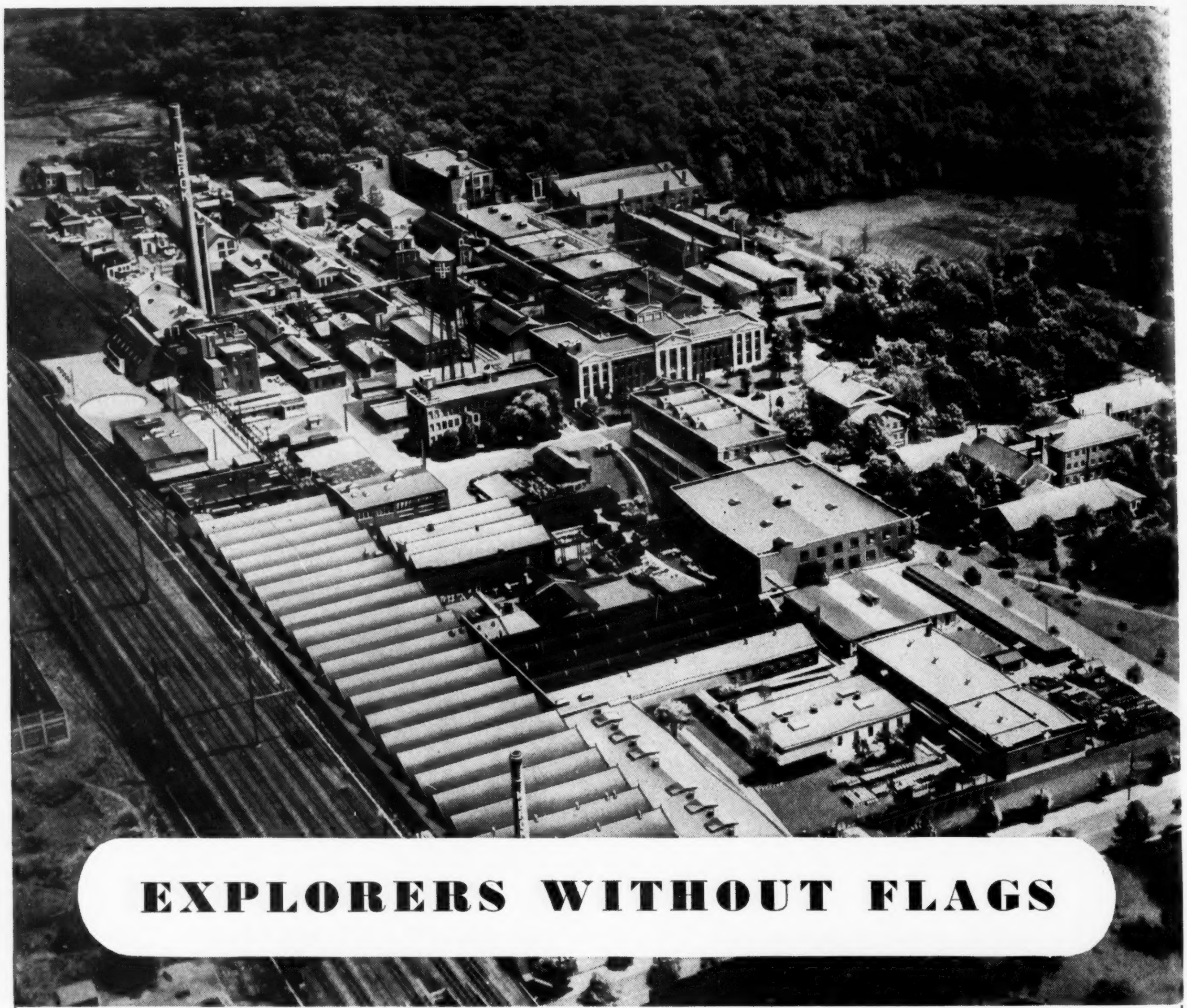
# AMERICAN CYANAMID & CHEMICAL CORPORATION

*A Unit of American Cyanamid Company*

30 ROCKEFELLER PLAZA NEW YORK, N. Y.

*Trademark of American Cyanamid Company. Patent Pending. **Trademark.


Ognibene




*Explorers of new lands may herald their exploits by the planting of flags. But explorers of modern chemistry must measure their achievements by the confidence won and kept in the professions and industries they serve.*

The high recognition accorded to Merck Chemicals throughout America is its own proof of how well the House of Merck has kept faith with those whom it serves. Today, nearly 3,000 products are supplied to various branches of industry, to laboratories, physicians, dentists, veterinarians, pharmacists, chemists, and the general public.

The Merck policies of scientific research and rigid laboratory control . . . backed by a rich tradition of experience and modern production facilities . . . assure continued leadership in present fields of chemistry, as well as in those still to be explored and conquered.

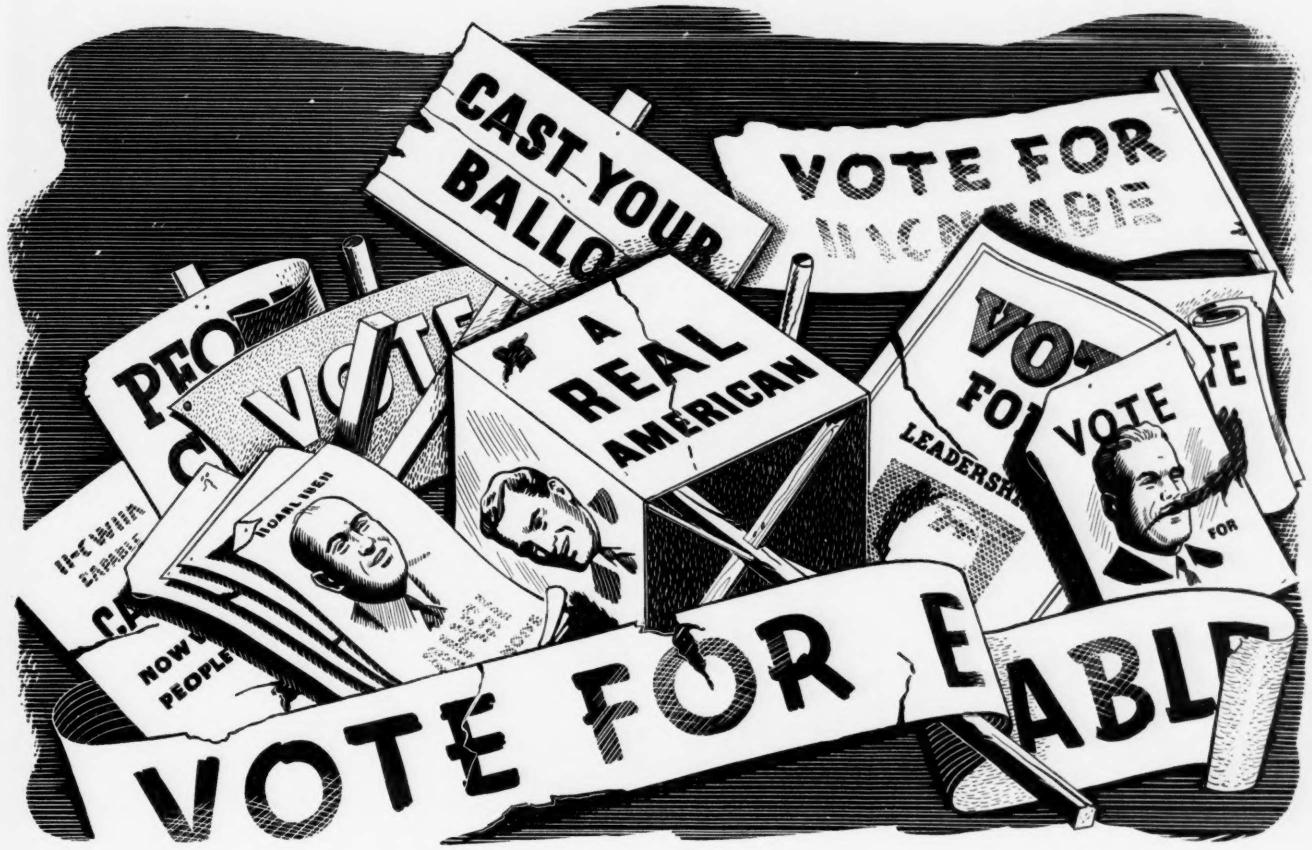
MERCK & CO. INC. *Manufacturing Chemists* RAHWAY, N. J.
NEW YORK PHILADELPHIA ST. LOUIS
*In Canada:* Merck & Co. Ltd., Montreal and Toronto

MERCK

MERCK

FINE CHEMICALS FOR THE PROFESSIONS AND INDUSTRY SINCE

★ *1818* ★




## AS THE NATION TURNS TO THE TASKS OF '41

Unclouded now by the confusions of a nation's march to the polls, are the realities of our tasks for 1941. Whether your part in these undertakings is large or small, it is more urgent than ever to assure adequate supplies of the raw materials you'll need.

If your processes involve the use of Caustic Soda, Soda Ash, Liquid Chlorine, Sodium Bicarbonate, or related products, we can help you substantially in planning for next year. Columbia products have always been noted for outstandingly high quality. Our capacity makes us one of the Industry's important producers.

But our substantial facilities can serve you most effectively only through advance planning. For this reason we urge prompt action in arranging for your next year's needs of Columbia products. Make an appointment now with a Columbia representative to discuss your requirements—and to learn how our policy makes certain that a Columbia contract means you'll get it—and get the best.

*Columbia Products Include*

**CAUSTIC SODA • SODA ASH**
**SODIUM BICARBONATE • LIQUID CHLORINE**
**MODIFIED SODAS • CAUSTIC ASH**
**CALCIUM CHLORIDE • CALCENE • PHOSFLAKE**

COLUMBIA
COLUMBIA CHEMICALS

# PITTSBURGH PLATE GLASS COMPANY

*Columbia Chemical Division*

30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

CHICAGO • BOSTON • ST. LOUIS • PITTSBURGH • CINCINNATI • CLEVELAND • MINNEAPOLIS • PHILADELPHIA

# STAUFFER CHEMICALS

## SULPHUR

Stauffer majors in the production of Sulphur and is recognized as the oldest and largest refiner of Sulphur in the world. The following Stauffer Sulphurs are available in convenient packages for immediate delivery: Rubber Compounding—Agriculture—Oil Refining—Sublimed Velvet Flowers—Light and Heavy Refined Flour—Refined Roll (stick)—Commercial Flour—Special Refined Salt Block—Refined Lump.

### OTHER STAUFFER PRODUCTS

BORIC ACID : CARBON TETRACHLORIDE : BORAX : TITANIUM TETRACHLORIDE : SULPHUR CHLORIDE : SILICON TETRACHLORIDE : CREAM OF TARTAR : SULPHURIC ACID : CAUSTIC SODA : TARTARIC ACID WHITING : LIQUID CHLORINE : CARBON BISULPHIDE : TEXTILE STRIPPER

### PACIFIC COAST PRODUCTS

SULPHATE OF ALUMINA : COMMERCIAL MURIATIC ACID : COMMERCIAL NITRIC ACID : COPPERAS : SUPERPHOSPHATE : NITRATE OF POTASH

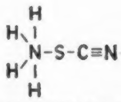
Stauffer

Stauffer Chemical Co.

420 LEXINGTON AVE., NEW YORK, N. Y.
230 NO. MICH. AVE., CHICAGO, ILL.
624 CALIFORNIA ST., SAN FRANCISCO, CAL.
555 SO. FLOWER ST., LOS ANGELES, CAL.
424 OHIO BUILDING, AKRON, OHIO
FREEPORT, TEXAS APOPKA, FLORIDA

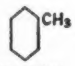
# Chemicals Derived from Coal

The development of the synthetic chemical industry has created an interest in chemicals from coal, many of which heretofore have not been available in the United States in commercial quantities.

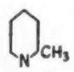

AMMONIUM THIOCYANATE

S
FLOTATION SULFUR


BENZENE


TOLUENE

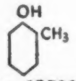

PYRIDINE

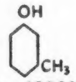

*alpha*-PICOLINE


QUINOLINE

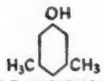

CARBAZOLE

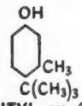

PHENOL

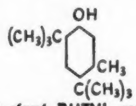

*ortho*-CRESOL

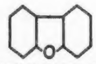

*meta*-CRESOL


*para*-CRESOL


3,5-XYLENOL

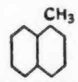

4-*tert*-BUTYL-*m*-CRESOL

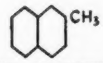

4,6-DI-*tert*-BUTYL-*m*-CRESOL

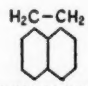

DIPHENYLENE OXIDE


DICYCLOPENTADIENE

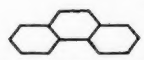

NAPHTHALENE


*alpha*-METHYL-NAPHTHALENE


*beta*-METHYL-NAPHTHALENE


ACENAPHTHENE


ANTHRACENE


PHENANTHRENE


FLUORENE

Some of these chemicals are already in commercial production and others, now produced in semi-commercial quantities, can be made available in larger volume if desired.

Koppers Technical representatives will welcome an opportunity to discuss with you the application of these chemicals in your own particular problems.

**KOPPERS COMPANY · KOPPERS BUILDING · PITTSBURGH, PA.**

# KOPPERS


READ THESE FACTS ABOUT
OPALWAX
DU PONT
"OPALWAX"
"Opalwax" is pearl white in appearance, odorless, tasteless. It is extremely hard, takes color readily and has a high melting point. An outstanding chemical property of "Opalwax" is its insolubility compared with ordinary waxes. It is not only emulsifiable but compatible.
USES....
Rubber-coated goods
Moisture- and grease-resistant containers
Electrical apparatus; e.g., condensers
Polishes, inks, coatings
Fibrous mechanical packings
Stiff leather goods • Carbon paper
Candles...in fact, wherever a wax or wax-like material is called for
"Opalwax" is shipped in flake form in bags. Before you specify any wax or wax-like materials, write for further information. Samples on request.
Tune in "Cavalcade of America"...NBC Red Network...Wed. Eve.
HIGH-PRESSURE CHEMICALS SYNTHETIC
E. I. DU PONT DE NEMOURS & CO. (INC.)
AMMONIA DEPT. WILMINGTON, DEL.

# Washington

*By*

**MACK H. WILLIAMS**

NATIONAL defense has been firmly established as the dominant theme of the third term, but looming now is a three sided tug-of-war between the New Dealers, business, and the military establishment over the methods of obtaining maximum results from the defense program.

At the very least, the clash of viewpoints will result in changing the present National Defense Advisory Commission setup. More serious is the possibility that it may convince Washington officials that they must struggle with business for control of our economic order, and launch a new series of basic legislative "reforms."

Each of the three groups views the defense program differently. To the Army and Navy, the sole objective is building up the armed forces to meet any contingency, with sufficient output of supplies at home to maintain them anywhere.

**Mack Williams**

The New Dealers endorse this, but they insist that the program be utilized to solve the unemployment problem and iron out the dips and valleys of industrial production. Business, while enthusiastic for defense, is reluctant to be maneuvered into a position whereby the adverse impact of the program on its interests is continued in force after the emergency ends.

### Task of Congress

Bridging these gaps to achieve national unity in actuality as well as theory will be the task of Congress in the new session. Immediate plant expansion, taxes, inflation and labor will be the focal points around which the session will revolve.

Government economists are urging the President to do something about the apparent reluctance of key heavy industries like steel to expand plant capacity to meet emergency requirements. Unless expansion takes place at a far greater rate than now contemplated, they warn, the defense program will not rout unemployment as intended by the New Deal.

Their analysis is based on the belief that shortages of key materials will develop before the winter is over, slowing down production at a time when Britain may need the greatest amount of aid to keep from collapsing.

Restriction of the use of these materials in consumer-goods industries will follow, curtailing employment there and sacrificing the consumer standard of living. Expansion by industry to supply both military and consumer needs, even if the sprawling production facilities lead to low prices and lower profits once the emergency ends, is the solution advanced by the economists.

### Sacrifices Necessary

Business spokesmen have replied that in a national emergency the reduction of civilian consumption is a necessary sacrifice. As for over-expansion, they point to the depression which this condition brought after the World War.

What the President will do depends on his personal reaction to the economists' analysis, and his personal gauging of the popular temper. He will try every degree of suasion before he makes a public issue of the matter, since then he would be open to the charge of torpedoing national harmony. The priorities mechanism may be invoked to threaten reluctant industries into expanding, and used indirectly to impress other industries.

Automobile makers, for example, may be told that they will get no steel unless they build their own steel mills. President Roosevelt will suggest government plants only as a last resort and if he thinks he has the country behind him.

### Disagreement on Taxes

The disagreement between business and government over this point extends to another—taxation. The President's dislike for a general sales tax, even if foods and medicines are exempted, is inspired by the New Deal belief that no reduction should be made in mass purchasing power until all the unemployed are back at work.

If the Administration's views are included in the draft of the 1941 revenue bill that will go to Congress, the emphasis will more likely be on excess profits and uninvested corporation savings taxes, together with broadening of the income tax base and increases in the commodity and income taxes.

The fears of business that unrestrained consumer buying will bring inflated prices are discounted by some of the economists upon whom the White House relies for advice. As long as the great pool of unemployed labor and unemployed capital is available, production of goods is not necessarily limited to the present level, in their view, and inflation can be headed off.

### Tailor-Made Control

To prevent excessive price rises in some of the industries most directly concerned with national defense, the suggestion has been made in the Defense Commission that a tailor-made control for the particular industry be adopted. This would prevent inflation caused by speculation, such as was evident in 1937, without resort to a total price control.

President Roosevelt declared at a press conference he is satisfied in a general way with the progress of the defense program, and that indicates the Defense Commission mechanism is working fairly well.

However, complaints from labor, from some sections of Congress, and the President's own realization that a certain lack of coordination is found inside the commission, make changes inevitable.

### Commission Only Advises

As the commission is purely an advisory agency, its recommendations for expediting the flow of raw materials into finished goods need not be accepted by the Army and Navy. No inclination to disregard the advice has ever come from the Munitions Building, but occasionally certain policies laid down by one of the seven defense commissioners, who operate completely independent of each other, are not carried out in practice by the military purchasing officials.

The unions have complained that Commissioner Sidney Hillman's rule against awarding contracts to bidders who have run afoul of the National Labor Relations Act has not prevented the Army from giving these firms huge orders.

In Congress, the dissatisfaction has

taken the concrete form of proposing substitutes for the commission. Senator Taft of Ohio is pushing a bill to create a War Resources Administration, to be composed of a $10,000-a-year, administrator, an advisory council of persons experienced in defense, and representatives of the important government agencies. The bill endows the administration with all the duties of the present Defense Commission, but requires that the Senate pass on the President's appointees.

**Wants Congressional Control**

Representative Rees of Kansas has introduced a bill to put a 10-man Congressional committee in a supervisory role over the Defense Commission. This committee would "keep itself currently informed" on the progress of defense and report to Congress regularly.

No matter what form the reorganization takes, priorities will continue to be directed mainly through the commission. In this connection, the Priorities Board has received word that chemical engineers predict difficulty will be encountered in expanding existing explosive plants and building new ones because of shortages of lumber, tools, boilers and similar materials. Some of the manufacturers have not yet taken on defense contracts, and they are concerned over the possible bottleneck facing them.

**No Preference Ratings**

The Priorities Board has indicated that it will not hand out preference ratings to take care of such cases, but will use its influence with lumber merchants to make sufficient quantities available to manufacturers who desire to build. Each situation will be handled on its own merits.

The schedule of priorities now in use is not expected to be permanent. It is based on the immediate needs of an army of 600,000, and the chemical industry anticipates that it will be called to serve an army of 2,000,000 men.

The rate at which the Army will be increased, and the increases in priorities this will occasion, are not being made public by the board. War Department authorities regard this information as a military secret.

---

## Bibliography On Gas

A bibliography on dry ice from 1835, when the gas was first solidified by Thilorier, through 1936, containing about 1200 references, arranged chronologically with separate author and subject indexes is now available as a 35mm. bibliofilm. It may be obtained from the American Documentation Institute, office of Science Service, 2101 Constitution av., Washington, by writing for document No. 1445. It costs $7.75.

CHEMICAL INDUSTRIES
*The Chemical Business Magazine*
*Established 1914*

## *Improving South American Relations*

THE press in this country is currently emphasizing the necessity for closer military cooperation between the nations of North and South Americas in order to prevent possible aggression by dictator nations in the Western Hemisphere. But as yet there is little evidence that the general public fully realizes what steps must be undertaken to improve the economic and cultural relations with the countries of Central and South America.

If solidarity of the Western Hemisphere is to be permanent then we must do much more than lend large sums to South American governments in order to permit them to purchase manufactured goods from us. Such loans may be necessary at the moment, but they are merely stop-gaps. Fortunately the Administration appears to appreciate this and is taking steps to determine how best to assist our neighbors to the south of us to raise the standard of living and hence the purchasing power of the masses.

We must appreciate that Latin and South Americas have lost approximately $571,000,000 in exports through inability to trade with the axis powers and the countries the dictator nations now control. This figure represents about 45 per cent. of the total. South America just previous to the outbreak of the present conflict exported 24 per cent. of its coffee, 11 per cent. of its meat, 20 per cent. of its copper, 52 per cent. of its linseed, and 28 per cent. of its nitrate to countries now effectively blockaded by Great Britain. Obviously some means must be found to assist our southern neighbors to find markets to replace previous purchases made by Europe and to re-establish buying power, and this must be done without interfering too seriously with our domestic industries and producers of raw materials.

To be permanently successful in improving our economic and cultural relations with South America we must show greater willingness than formerly to risk private capital investments. American manufacturers must attempt in a more determined manner to establish branch plants. These will provide work for the citizens of the countries where they are operating and will gradually help to raise the standard of living and the purchasing power of the masses more nearly to our level. The establishment of branch factories will tend to do away with the antagonism that has arisen against us in many quarters and will help to remove the barriers that have been set up against our goods. On their part most of the South American countries must revise their viewpoint that Uncle Sam is a "Shylock," and particularly must make it plain that American investments will be protected. Further, American industry must make a careful study of existing natural raw material resources of South America and also must determine what raw materials we require and that can be developed to the south of us with the help of American money.

Financial considerations are, however, only part of the story. There must be a much greater increase in the cultural relations than heretofore. We must do such things as exchange college professors, we must encourage our southern neighbors to enter our universities in greater numbers, and we, in turn, must seek to interest more of our young men to look upon work in foreign countries as a career, rather than a temporary expedient or a lark. We must study more seriously the languages, the customs, and the economic and cultural viewpoints of our southern neighbors, and, similarly, they must acquire a better insight into ours.

Many of these objectives cannot be reached immediately We must not lose sight of the fact, however, that the dictator nations and Germany in particular will most certainly make every effort to recapture the markets now lost.

The recent "White Paper," released by the Dies Committee, certainly appears to indicate that especially in the chemical field German interests have gone to great lengths to not only hold their established business in South America, possibly through the purchase of American-made chemicals for sale there through German-controlled merchandising organizations, but has also formulated ambitious plans for expansion in the Western Hemisphere in the event that Germany is victorious in the present struggle.

The Dies Committee should, however, clear up at least one point that it has raised. It has created the impression in the layman's mind that American chemical manufacturers have unwittingly assisted German interests in their plans for holding South American markets by making available large supplies for export. We are certain that such an impression is entirely wrong and not in accord with the facts.

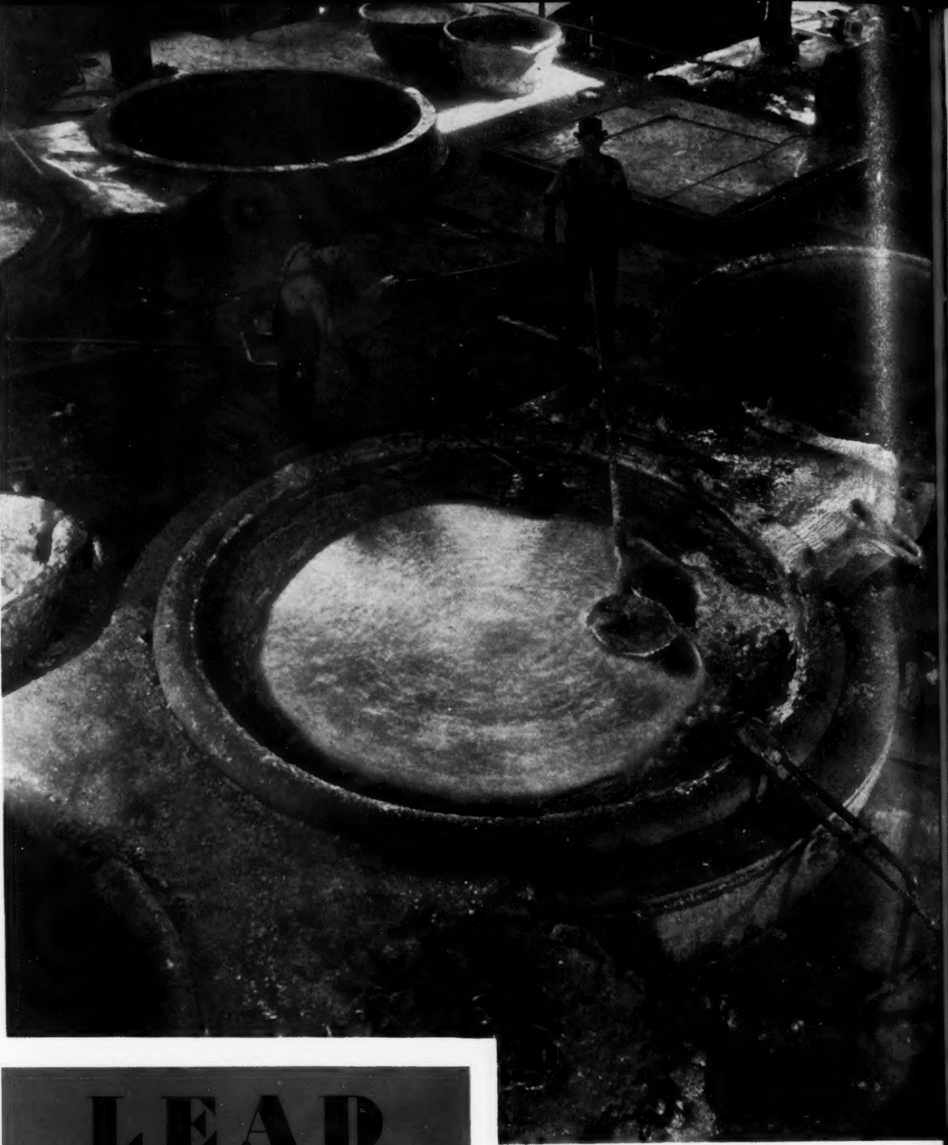
# LEAD In Chemistry

By

**Felix Edgar Wormser**

*Secretary-Treasurer, Lead Industries Assn.*

**Aside From the Long List of Derivatives Which Are Chemical By-Words, Lead is Invaluable in the Equipment of Many Plants. This, Another in Our Raw Materials Series, Discusses Both Uses.**



Above—Refining lead in the plant of a Northern Idaho smelter.

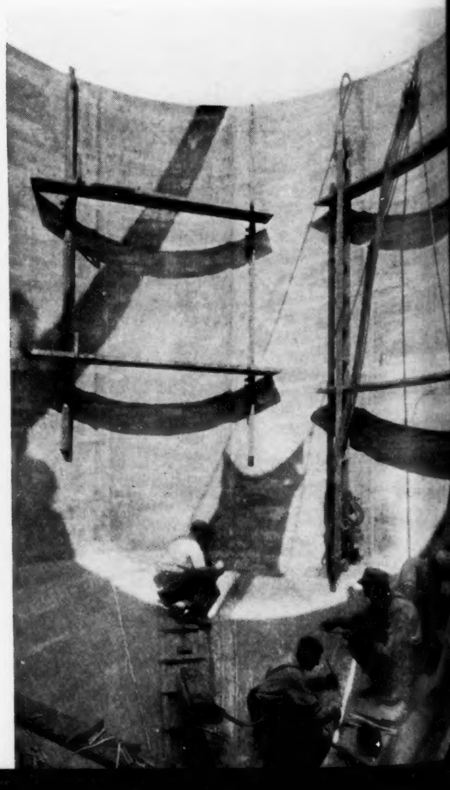
NOT only is lead an important raw material for the manufacture of many common chemicals such as white lead, red lead, litharge, lead arsenate and tetra-ethyl lead, but it is also an invaluable engineering material for the engineer in the design of chemical apparatus and processing equipment. Indeed without the availability of this inexpensive metal as a tank lining and piping, chemical engineers would experience considerable difficulty in finding adequate substitutes to produce and utilize efficiently some of the corrosive chemicals commonly used by industry.

### Useful Structure Qualities

Its noteworthy durability low melting point and softness are attributes of lead which enable chemical engineers to design quickly on the job special equipment that would be more costly to duplicate in other metals or non-metals. In addition, lead has a high salvage value. The proper use of lead in chemical apparatus is a subject too vast for discussion here, but without some recognition of the important part which the metal plays as a structural material in producing many chemicals, no article on the subject of lead and its importance to the chemical industry would be complete.

Lead is noted for its high resistance to corrosion by many industrial chemicals. In the following table will be

Right — Underground scene in a Missouri lead mine.



Below—Workers are shown lining a chemical tank with sheet lead.

found a list of the more common chemicals produced or used with the aid of lead:

| | |
|---|---|
| Aluminum Sulfate | Reductions |
| Ammonia Vapor | Sodium Bisulfate |
| Ammonium Sulfate | Sodium Choride Solution, or sea water |
| Antimony Tri-Chloride | |
| Bleach Liquors | Sodium Hydrosulfite |
| Brown Acid Mother Liquor | Sodium Hyposulfite |
| Carbonates Soluble | Sodium Sulfate |
| Chlorine Gas | Sodium Sulfide |
| Hydrofluoric Acid | Sodium Sulfite |
| Koch's Acid | Sulfonations |
| Mixed Acids | Sulfur Chloride |
| Nitration Mixture of H-Acid | Sulfur Dioxide |
| Para-nitrophenol | Sulfuric Acid |
| Phosphoric Acid | Sulfurous Acid |
| Phosphorous Chloride | Sulfuryl Chloride |
| Zinc Chloride | |

Lead is a common non-ferrous metal produced plentifully in many parts of the world from ores containing galena, the sulfide, notably in the United States, Canada, Mexico, Spain and Australia. Next to iron it is the cheapest metal. The United States is particularly blessed with large lead ore reserves in Missouri, Idaho, Utah and other states, and ranks as the principal lead producing country in the world, accounting for roughly one-quarter of the world's mine production. About 450,000 tons are mined annually from domestic deposits. Our neighbors, Mexico and Canada, are also important lead producing countries. Another important source of supply is the lead derived from scrap such as old chemical tank linings, drosses, pipe and storage battery plates. At times the amount of lead from scrap has equalled the amount newly mined.

The chemical industry uses lead both as a raw product and engineering material in several grades. Of late the number of grades has been increased through a revision of the Specification for Pig Lead (B 29-35) of the American Society for Testing Materials. The proposed new specification covers seven types of lead as follows:

| | |
|---|---|
| Corroding Lead | Copper lead |
| Chemical Lead | Common desilverized lead A |
| Acid Lead | Common desilverized lead B |
| Soft undesilverized lead | |

Where an exceptionally pure lead is desired, especially in the manufacture of basic carbonate white lead, the grade known as corroding lead must be used. This is a premium grade of lead because of its higher purity. Unless a lead of corroding quality is used for white lead manufacture for certain processes, impurities will cause the product to be off-color.

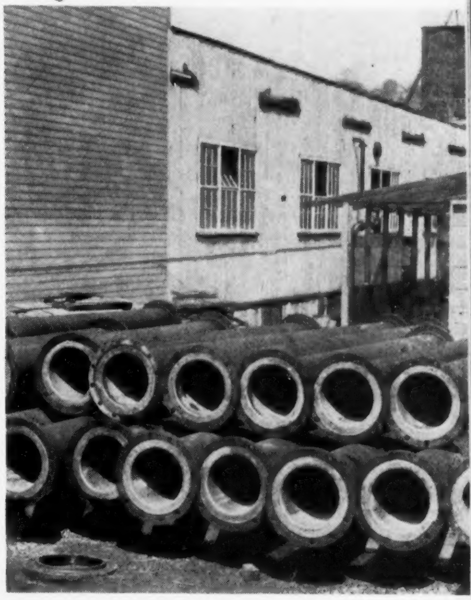
When the common impurities found in lead in small quantities are no hindrance in production of lead chemicals, ordinary common or desilverized lead may be used.

Other grades of lead, known as chemical lead and acid lead are used more for the design of chemical equipment than as a source of chemicals, hence their names.

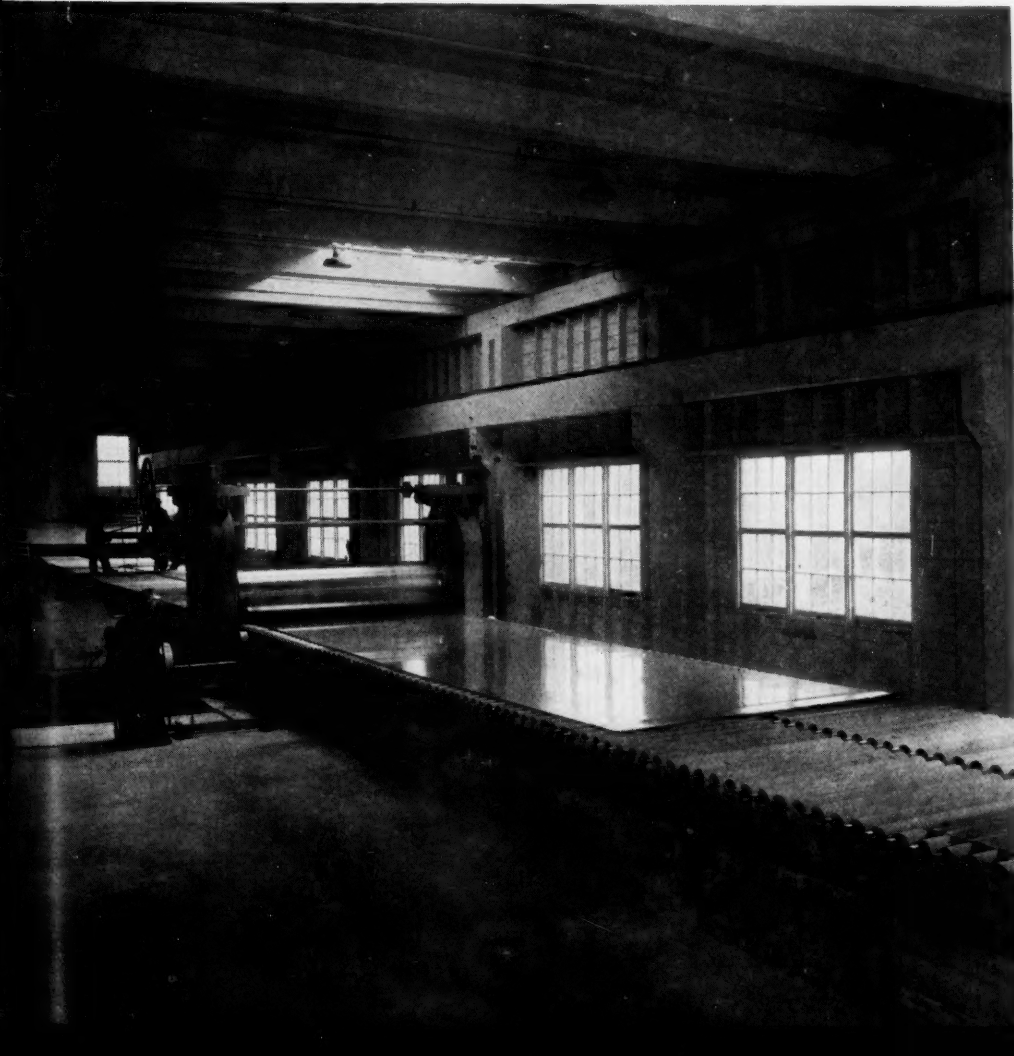
In view of the importance of small amounts of impurities in classifying grades of commercial lead the above analytical table of chemical requirements is taken from the latest specifications of A.S.T.M.

**American Society for Testing Materials Lead Specifications**
**Chemical Requirements**

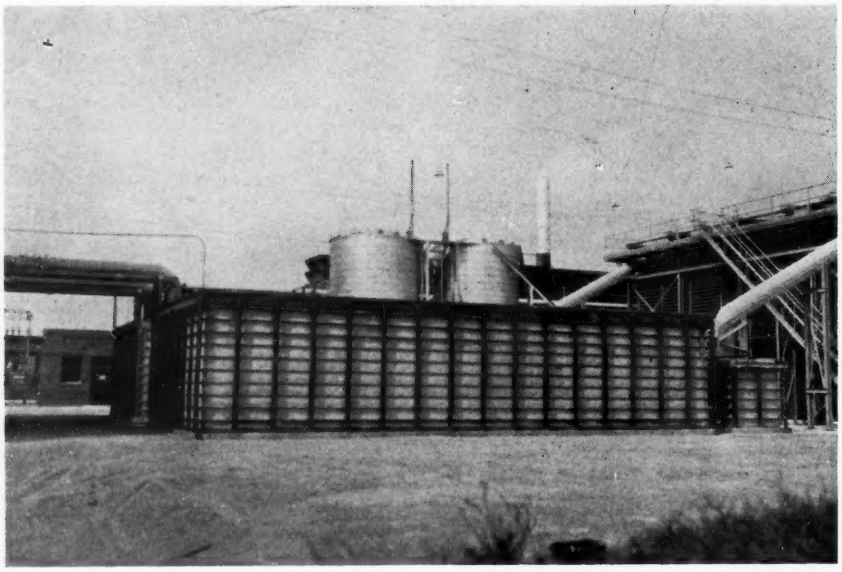
| | Corroding Lead | Chemical Lead | Acid Lead | Copper Lead | Common Desilverized Lead A | Common Desilverized Lead B | Soft Undesilverized Lead |
|---|---|---|---|---|---|---|---|
| Silver, max., per cent. | 0.0015 | 0.020 | 0.002 | 0.020 | 0.002 | 0.002 | 0.002 |
| Silver, min., per cent. | ..... | 0.002 | .... | .... | .... | .... | .... |
| Copper, max., per cent. | 0.0015 | 0.080 | 0.080 | 0.080 | 0.0025 | 0.0025 | 0.04 |
| Copper, min., per cent. | ..... | 0.040 | 0.040 | 0.040 | .... | .... | .... |
| Silver and copper together, max., per cent. | 0.0025 | .... | .... | .... | .... | .... | .... |
| Arsenic, max., per cent. | 0.0015 | .... | .... | .... | .... | .... | .... |
| Antimony and tin together, max., per cent. | 0.0095 | .... | .... | .... | .... | .... | .... |
| Arsenic, antimony, and tin together, max., per cent. | ..... | 0.002 | 0.002 | 0.015 | 0.015 | 0.015 | 0.015 |
| Zinc, max., per cent. | 0.0015 | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.002 |
| Iron, max., per cent. | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Bismuth, max., per cent. | 0.05 | 0.005 | 0.025 | 0.10 | 0.15 | 0.25 | 0.005 |
| Lead (by difference), min., per cent. | 99.94 | 99.9[illegible] | 99.90 | 99.85 | 99.85 | 99.73 | 99.93 |



Above—Lead lined iron pipe commonly used in the chemical industry.



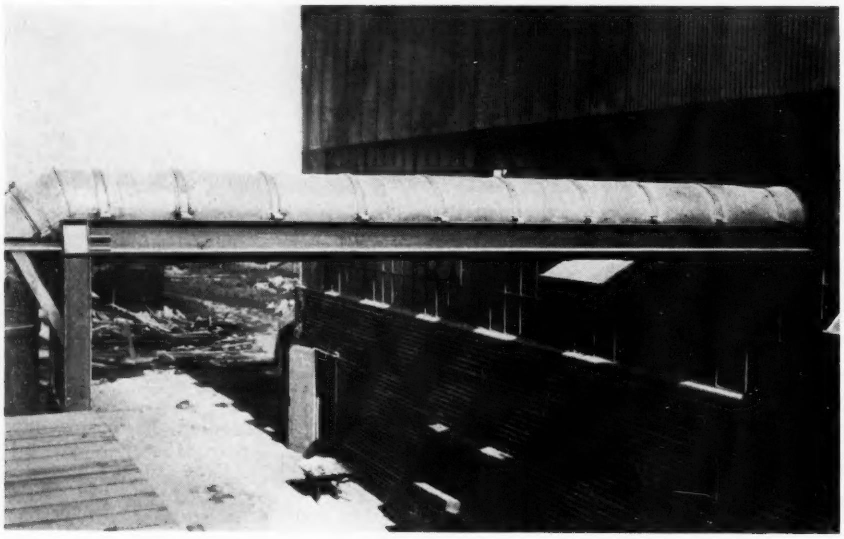
Left—Rolling sheet lead for the chemical industry.



**Above—All lead chambers in sulfuric acid system.**

**The lead installations shown in these two photographs can be readily fabricated on the job. After serving a useful life the lead has a high scrap value.**

**Below—Solid lead flue conveying sulfur dioxide gas.**



The lead smelting and refining industry has facilities from coast to coast, in the middle west, and in the south so that customers in any part of the country may be served promptly and efficiently with the type of lead they desire.

The selling of lead in the United States is highly competitive. Customers are served principally by the following lead mining and refining companies:

American Metal Co. Ltd.
American Smelting & Refining Co.
Bunker Hill & Sullivan Mining & Concentrating Co.
Eagle-Picher Mining & Smelting Co.
International Smelting & Refining Co.
National Lead Co.
St. Joseph Lead Co.
United States Smelting Refining & Mining Co.

Being a world commodity lead is subject to many economic forces affecting its market. Fluctuations in the price of lead at the two major markets, New York and St. Louis, are common and the daily press throughout the United States generally carries the latest quotations.

In chemical engineering several types of lead will be found used, particularly chemical lead, and antimonial lead. Newer products are tellurium lead and acid lead. Although the multiplicity of grades may appear confusing, they are readily distinguishable on chemical analysis. Chemical lead is the designation applied to a native product of the south-eastern Missouri lead mines. It contains about .06 per cent. copper. Antimonial lead is an alloy of lead and generally 6 per cent. antimony. Tellurium lead is an alloy containing 0.045 per cent. tellurium. Acid lead contains .02 per cent. bismuth and .06 per cent. copper. These grades provide the chemical engineer with varieties differing in acid resistance, mechanical strength and other properties. They all furnish a metal that is low in cost, easily worked and installed and which possesses a high salvage value.

Antimonial lead has roughly twice the tensile strength of chemical lead and is not so easily abraded. It is, therefore, frequently used in installations requiring greater resistance to mechanical strain or erosion. At elevated temperatures antimonial lead should not be used for it is weaker than chemical lead at temperatures above the boiling point of water.

Sheet lead and lead pipe are the two commonest forms in which lead is used by the chemical industry to line vats, agitators, tanks and other chemical equipment. It may also be used as a protective covering for apparatus subjected to corrosive fumes or acids In the production and use of one of the chemical cornerstones of industry—sulfuric acid—lead is especially useful. It also gives excellent service in the paper industry and in handling phosphoric and hydrofluoric acids. Lead "burning," the autogenous welding of lead, is a highly developed art in the chemical industry. Producers of the many varieties of lead used in the chemical industry are always glad to give detailed information to users.

The market for lead chemicals is the largest one open to the lead mining industry and the most important chemical products produced from pig lead, (some from lead ore) are the carbonate white lead, basic lead sulfate, the oxides, litharge and red lead, lead arsenate and tetraethyl lead. Adequate statistical information about the production of some lead chemicals is not available but we do know that about 100,000 tons of white lead are produced annually in the United States; about 75,000 tons of litharge and 30,000 tons of red lead. The amount of lead going into tetraethyl lead is now large. The importance of these chemical lead compounds to the prosperity of the lead mining and smelting industry is quickly apparent when one realizes that the lead content of the four principal chemical lead products listed above is equivalent to over one-half of the domestic production of lead mined in the United States.

## Aid Diversified Industries

Lead compounds furnish the raw material for highly diversified industries such as the paint, storage battery, pottery, glass, rubber, insecticides, oil refining and gasoline manufacture. Without the availability of these lead compounds, everyday life would suffer inconvenience. In view of their importance, a brief description of these compounds and a few others and their uses follows:

*Hydrated Basic Lead Carbonate*—$2PbCO_3Pb(OH)_2$ more commonly known as basic carbonate white lead or simply white lead, forms the basis of the highest grade

The Golden Gate Bridge painted with both the oxide of lead—red lead—and basic lead chromate.

paint. It remains the premier paint pigment when combined with linseed oil, from the standpoint of durability and economy, and is the standard paint for application to exteriors. There are three general methods commercially used for the manufacture of white lead, (1) the old Dutch process requiring 90 to 120 days for the production of the material, (2) the Carter process and (3) the precipitation process, based in part on chemical or electrolytic methods which produce the product within two days or a little longer. Of late years, research has considerably improved the quality of the commercial white lead suitable for use by the manufacturers of mixed paint, notably in the direction of the finer particle size and higher tinting strengths. A new lead pigment, lead titanate promises to furnish a new chemical outlet for lead.

*Basic Lead Sulfate*, also known commercially as "Sublimed White Lead" is a pigment similar in appearance to white lead, but it is made directly by sublimation from lead ore, rather than by the use of chemicals. It is essentially a fume and is widely used by the paint industry. If the ore contains a little zinc, it is recovered in the sulfate as a zinc oxide which is also a white powder used by paint manufacturers.

Especially pure basic lead sulfate, known as "Super Sublimed White Lead" is made directly from atomization of molten lead in the presence of air and sulfur dioxide and contains no zinc. It is an important paint pigment.

There is another form of Basic Lead Sulfate known also as "Sublimed Blue Lead" which is slate gray in color. It consists of basic lead sulfate, lead sulfite, lead sulfide, zinc oxide and a very small amount of carbon from which it obtains its grayish color. It is made directly from lead ore. This material is used as a pigment in paint for the prevention of rust on steel structures.

*Litharge*—PbO—an oxide of lead, has a buff color, being produced in both powder and flake form. It is made directly from pig lead in specially designed furnaces of the reverberatory or cupel types in the presence of air so as to oxidize the lead. Powdered litharge is generally a product of treatment in a reverberatory furnace; flake litharge in a cupel furnace. The numerous grades of litharge differ in size and purity. Grades are known commercially by the use to which the litharge is to be applied, such as glassmakers', colormakers', rubbermakers', varnishmakers', potterymakers', enamelers', oil refiners' and battery litharge. Litharge has always impressed me with being one of the common indispensable chemicals working in numerous industries performing important tasks for which it receives very little recognition. It is one of those chemicals about which a book can readily be written because it plays a part in so many useful chemical processes and products.

Illustrating the widely varying outlet of the litharge manufacturer, the following table indicates that almost half the market is in the storage battery industry but the tonnage of litharge used by insecticide manufacturers, oil refiners, the ceramic industry and chrome pigment manufacturers, is also important in the aggregate:

LITHARGE SALES*
(In Short Tons)

| Industry | 1939 |
|---|---|
| Storage batteries | 39,754 |
| Insecticides | 16,435 |
| Ceramics | 8,679 |
| Chrome pigments | 7,815 |
| Oil refining | 7,619 |
| Varnish | 2,428 |
| Rubber | 1,404 |
| Linoleum | 226 |
| Other | 5,158 |
| Total | 89,518 |

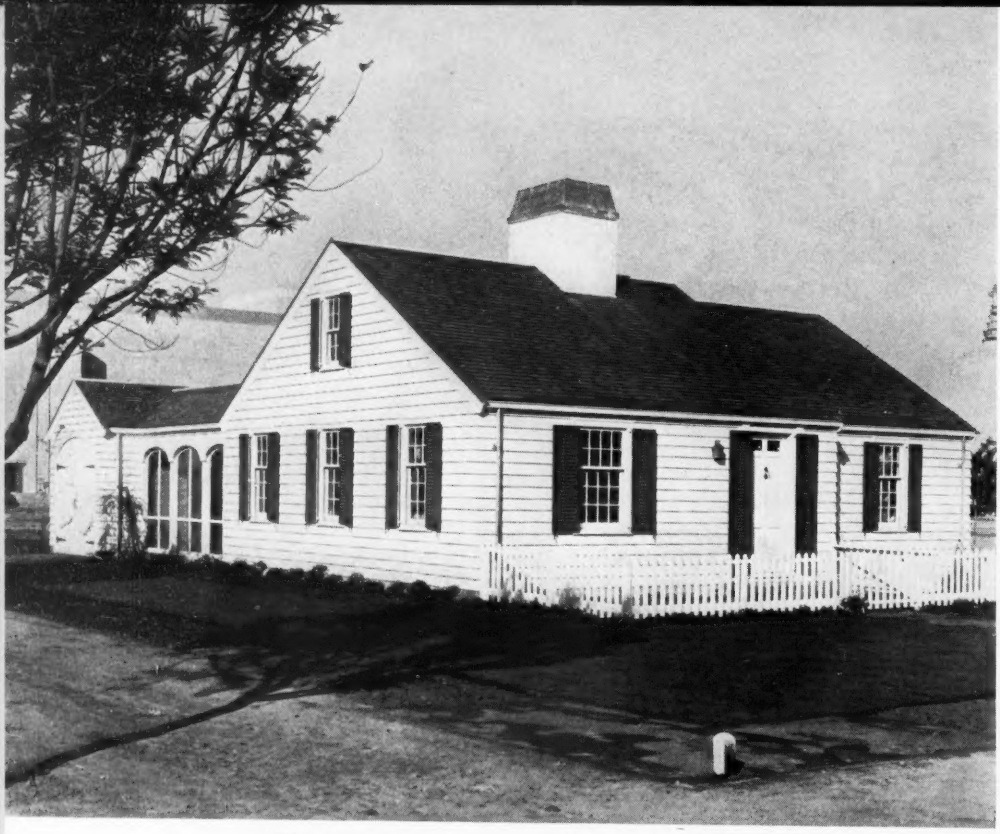
*Red Lead*—Although public familiarity with red lead generally is limited to its observance as a bright orange-red paint on bridges and steel work, there is another use which eclipses its application in paint about two to one. This is its use in the construction of storage batteries as the following table demonstrates:

RED LEAD SALES*
(In Short Tons)

| Industry | 1939 |
|---|---|
| Storage batteries | 24,709 |
| Paints | 11,421 |
| Ceramics | 1,123 |
| Other | 2,723 |
| Total | 39,976 |

Red lead is an oxide of lead having the formula $Pb_3O_4$ and is manufactured by heating powdered litharge under carefully controlled temperatures. A measure of the quality of a red lead is how much unconverted litharge remains in the product. Owing to constant improvements that have been made in manufacturing processes, the red lead of commerce is today higher in $Pb_3O_4$ content than it was a few years ago and almost completely free from unconverted litharge. Red leads for paint are today being produced with 98 per cent. "True Red Lead" content.

* Minerals Yearbook 1940. U. S. Bureau of Mines.



Western pine home shown at Golden Gate International Exposition; like many other homes it is painted with white lead.

This is an advantage in furnishing a pigment, which, when mixed with linseed oil, reduces the tendency of the paint to harden or settle in the can. It does not have to be used immediately. Red lead is the standard metal protective paint the world over, and has maintained its preeminent position for decades.

A lesser known oxide of lead is orange mineral made from basic carbonate white lead which is used principally in the manufacture of printing inks and colors.

The prize example of a comparatively new lead chemical that has grown phenomenally in use is tetraethyl lead, $Pb(C_2H_5)4$. Practically unknown fifteen years ago by the public, today millions are aware from actual experience of its value in improving the quality of gasoline. So widespread has its use become that about 75 per cent. of all gasoline sold in the United States now contains ethyl fluid. No competition threatens its preeminent position, unless it be a lead alkyl, and the future for its continued use looks bright indeed.

## No Saturation Point

It appears that no limit is in sight yet as to the amount of tetraethyl lead which may be required in the future by gasoline refiners. No sooner does the petroleum engineer discover a means of increasing the octane rating of his product through improvement of refining methods, than someone finds that, by adding tetraethyl lead to the resultant product it is further improved. Automotive engineers promise us still higher compression ratios and it is necessary that the fuel be of such quality that it may be used in those engines without knocking. The answer is, of course, ever higher octane ratings for gasoline. Automotive engineers also promise outstanding economies in the operation of automobiles at high speeds through the use of higher compression engines and higher octane fuels. Experimental work has shown that if the compression ratio is increased (and higher octane gas is needed if that is done) fuel economies at speeds of 50 to 60 miles per hour can be improved about 50 per cent. To fulfill these desirable objectives large amounts of tetraethyl lead will probably have to be used in raising octane ratings still higher than they are today.

## Tetraethyl Reaction

Chemical engineers are familiar with the fundamental reaction necessary to produce tetraethyl lead. Briefly it is made from an alloy of lead and sodium which reacts with ethyl chloride. To procure the needed raw materials, exclusive of lead, in the quantities required, chemical engineers have had to develop new sources of supply. In addition, bromine, a supplementary ingredient of ethyl fluid, has to be recovered from sea water. Chemical engineers wrote a brilliant chapter in scientific research when they developed a practical means for extracting the element from the ocean.

From 11,000 to 18,000 tons of litharge are converted each year to the important arsenical, lead arsenate. I don't think any chemical has ever had more attention given to it by chemists in an effort to put it out of business than lead arsenate. As an insecticide it is highly efficient but, owing to the public health problems involved, research quite understandably is constantly striving to discover some less toxic and harmless substitute, so far without success.

Lead arsenate is made from litharge generally by agitation with a weak acetic or nitric acid to which a solution of arsenic acid is slowly added. The reaction is cyclical in that the process recovered the acetic acid originally used while the litharge is gradually consumed.

## Lead Chromates

Another series of chemicals noted for their color and protective qualities are the lead chromates. These are made by precipitation from lead acetate or lead nitrate to which potassium or sodium bichromate have been added.

The normal lead chromate is the medium chrome yellow of commerce. A paler variety is obtained by adding sulfuric acid or aluminum sulfate to the bichromate solution. This causes some white lead sulfate to form, lightening the yellow tint of the normal lead chromate.

Chrome red is made by dissolving caustic soda in the bichromate solution before adding the lead solution. It is a basic lead chromate, and, instead of lead acetate being used as the raw lead material from which it is manufactured, white lead is commonly used. Chrome red is also known as American vermilion and is the most permanent red pigment available to the painting trade.

Mixtures of chrome yellow and chrome red supply numerous useful gradations of chrome pigments with orange toned hues.

Another important chrome paint pigment is chrome green. It is a mixture of yellow lead chromate and Prussian blue, or Chinese blue. It is a preferred green pigment where the strongest tint retention characteristics are desired. From the lead chromate pigments briefly described a wide variety of colored paint pigments may be made.

There are other lead chemicals too numerous to mention here which have specialized applications such as lead azide for explosives, lead oleate in lubricants, lead antimonates and bisilicates in ceramics, sodium plumbite in oil refining and others. Space requirements forbid including them all. Then there are lead anodes so important in some chemical processes like chrome plating.

Outside the phenomenal growth in tetraethyl lead, most of the outlets for lead in the chemical industry today are those with which it has been associated for many years, in some cases for centuries.

Because lead is one of the cheapest metals and has many valuable chemical properties, it will continue to be an important chemical raw material for a long time to come.

# EARL P. STEVENSON

By A. D. McFadyen

THE career of Earl P. Stevenson, president of Arthur D. Little, Inc., is an example of the rapid progress possible in the expanding field of applied chemistry for properly qualified men who supplement ability with intense application.

Born in Logansport, Indiana, on October 2, 1893, Mr. Stevenson spent his early life in the Hoosier State. Following his graduation from High School he went to Wesleyan University, from which he graduated in 1916 with the degree of Bachelor of Science. He then entered the Massachusetts Institute of Technology for his Master's degree, meanwhile serving there as an instructor of chemistry. During the War years, he was a First Lieutenant in the Chemical Warfare Service.

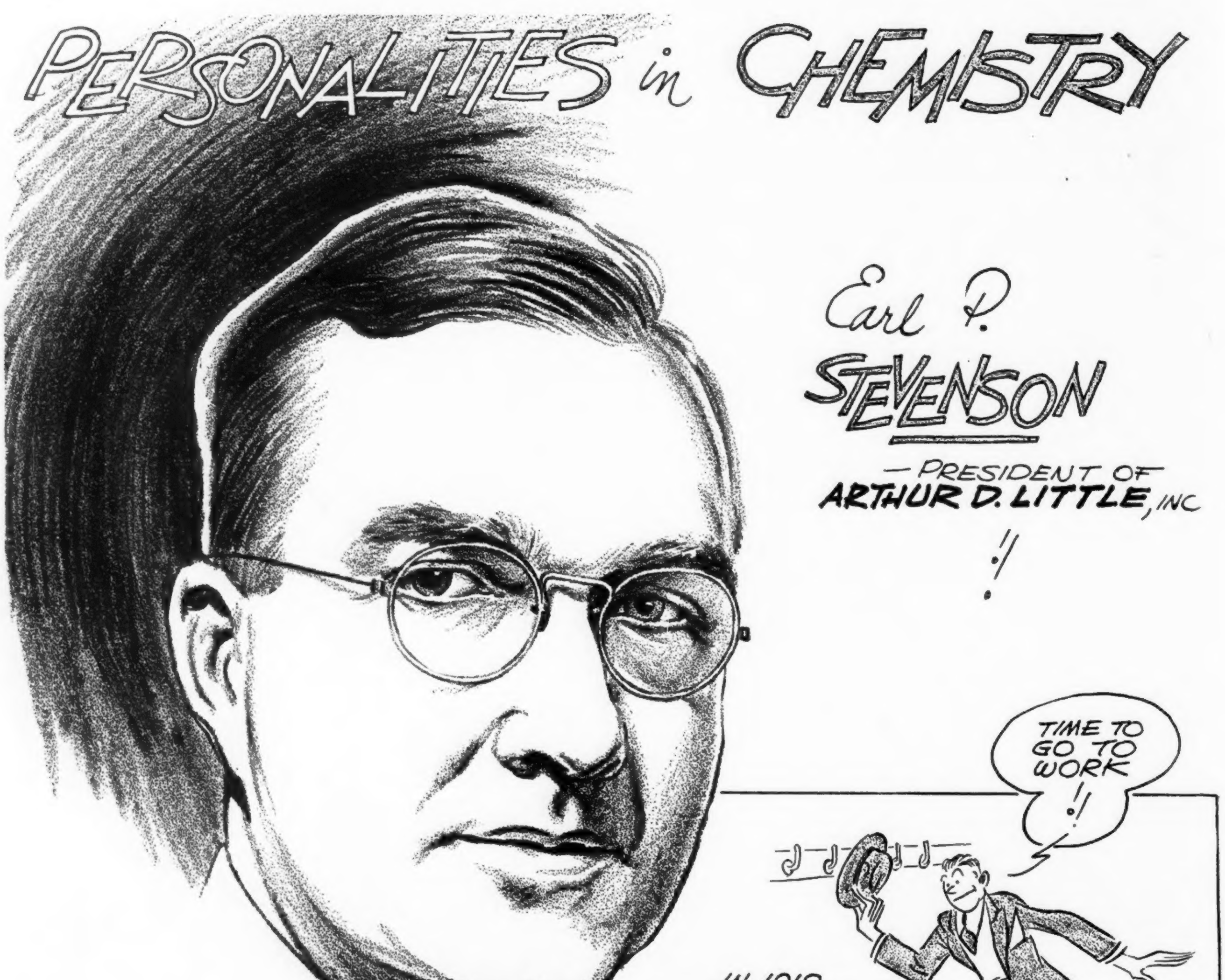
Mr. Stevenson's industrial career began in 1919 when he joined the staff of Arthur D. Little, Inc., research chemists and engineers, of Cambridge, Massachusetts. His duties rapidly became of such importance to the Little research program that he was made Research Director in 1920, and, growing with the organization, he has continued since that time in active charge of a multitude of research activities. In the early thirties Dr. Arthur D. Little, the company's founder, gradually relinquished his more arduous duties and took the position of Chairman, and in 1935, Mr. Stevenson was made President. Upon Dr. Little's death a few months later, the burden of directing the administrative and research policies and activities of the organization fell upon Mr. Stevenson's shoulders. During Mr. Stevenson's tenure as director of the research activities of Arthur D. Little, Inc., the organization has engaged in solving a wide variety of chemical problems submitted to it, and in the application to industry of many new discoveries in the field of chemistry. Many of these activities have been under Mr. Stevenson's direct supervision, and a goodly proportion of the others had the benefit of his collaboration and advice. His earliest work with the Little organization included the development of processes for the recovery of potassium salts from brines, the hydrometallurgical treatment of zinc ores to recover zinc compounds, and the processing of Florida pebble phosphate.

Almost continuously from the time of joining the Little organization, Mr. Stevenson has been closely associated with the developments in the soap, glass, paper and petroleum industries. In particular, he has participated in the development of processes for the spray-treatment of soap and for the improvement of soaps and detergents, including studies of the fundamental structures of soaps. He has been closely associated with the research activities in the glass fiber industry, which has shown such a phenomenal growth in recent years. Now in extensive commercial use are a number of his inventions relating to the manufacture of molding compositions and building boards from mixtures of fibers and plastic materials. Under the direction of Mr. Stevenson the Little organization has conducted extensive research in the field of petroleum chemistry, especially in the development of processes, including pilot plant operations, for producing a wide variety of chemicals from petroleum.

These are merely illustrative of Mr. Stevenson's manifold interests in the field of industrial chemistry. Many other examples could be given, including some in fields as varied as synthetic resins and citrus fruits, or naval stores and the manufacture of products from chrome ore. Patents have been issued to him in most of the fields mentioned. An appreciable portion of his time is devoted to giving technical advice in the prosecution of patent applications, and in serving as expert witness in patent Litigations. Although the latter activity is absorbing (if not exhausting) and serves as a real test of knowledge, concentration and reasoning, Mr. Stevenson much prefers spending his efforts on projects more directly concerning developments and improvements in the chemical industry. The scope of Mr. Stevenson's current interests may be appreciated from the fact that he is in close contact with most of the major problems which the Little organization handles for its numerous clients, covering varied branches of the chemical field. The laboratories have a personnel of nearly a hundred; many of the staff have "grown up" in the organization with Mr. Stevenson and have benefited by his guidance and assistance in their professional development. Under his leadership, the company's business has shown a steady growth, and in the present year is the largest in its history.

In addition to his activities with the Little organization, Mr. Stevenson takes an extensive part in the work of technical, educational, and civic bodies. He is a member of many societies including the American Institute of Chemical Engineers, American Chemical Society, American Association for the Advancement of Science, The Newcomen Society of England, and he is on the executive committee of the American Section, Society of Chemical Industry. He holds alumni council or committee positions with Massachusetts Institute of Technology and Wesleyan University, and is a Trustee of Northeastern University.

Mr. Stevenson, with his wife and three daughters, resides in Newton, Massachusetts, where he has found time to participate in local business and community affairs.


PERSONALITIES in CHEMISTRY
Earl P. STEVENSON
—PRESIDENT OF ARTHUR D. LITTLE, INC
TIME TO GO TO WORK !!
IN 1919, HE BEGAN HIS INDUSTRIAL CAREER BY JOINING THE STAFF OF ARTHUR D. LITTLE, INC. —HE OBTAINED HIS MASTER'S DEGREE AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY
HE SERVED AS A FIRST LIEUTENANT IN THE CHEMICAL WARFARE SERVICE IN THE WORLD WAR
HE HAS BEEN CLOSELY ASSOCIATED WITH EXTENSIVE RESEARCH IN MANY FIELDS OF CHEMISTRY

# CHEMICAL ENGINEERS' STAKE

## In Free Enterprise

**By James W. Irwin,** ***Assistant to President, Monsanto***

**In This Timely and Interesting Paper Delivered Before the New Orleans Meeting of A. I. Ch. E., Mr. Irwin Discusses the Role of the Chemical Engineer in Combatting the Dangers That Confront Our System of Free Enterprise.**

LET me define first what I mean when I talk about free private enterprise. To my way of thinking a free enterprise system is a system wherein industry and trade are privately owned, and are managed by the owners in accordance with their own judgment *insofar* as this does not endanger the recognized social rights of others. To insure this last condition—respect for the social rights of others—policing by government must be a part of the free enterprise system. I place emphasis on the fact, however, that I include policing only, not control or ownership.

Let me explain also that I will use the terms "free enterprise system" and "democracy" interchangeably, since these terms are direct counterparts of each other. We cannot, in other words, have a free economic system without a democratic form of government, nor can democracy exist without free economy. The two are inseparably bound together.

The exact opposite of the free enterprise-democracy combination is, of course, collectivist economy and totalitarianism—or state socialism, or communism, or any of the other "isms" which are based upon centralization of power and authority in the state rather than in the people.

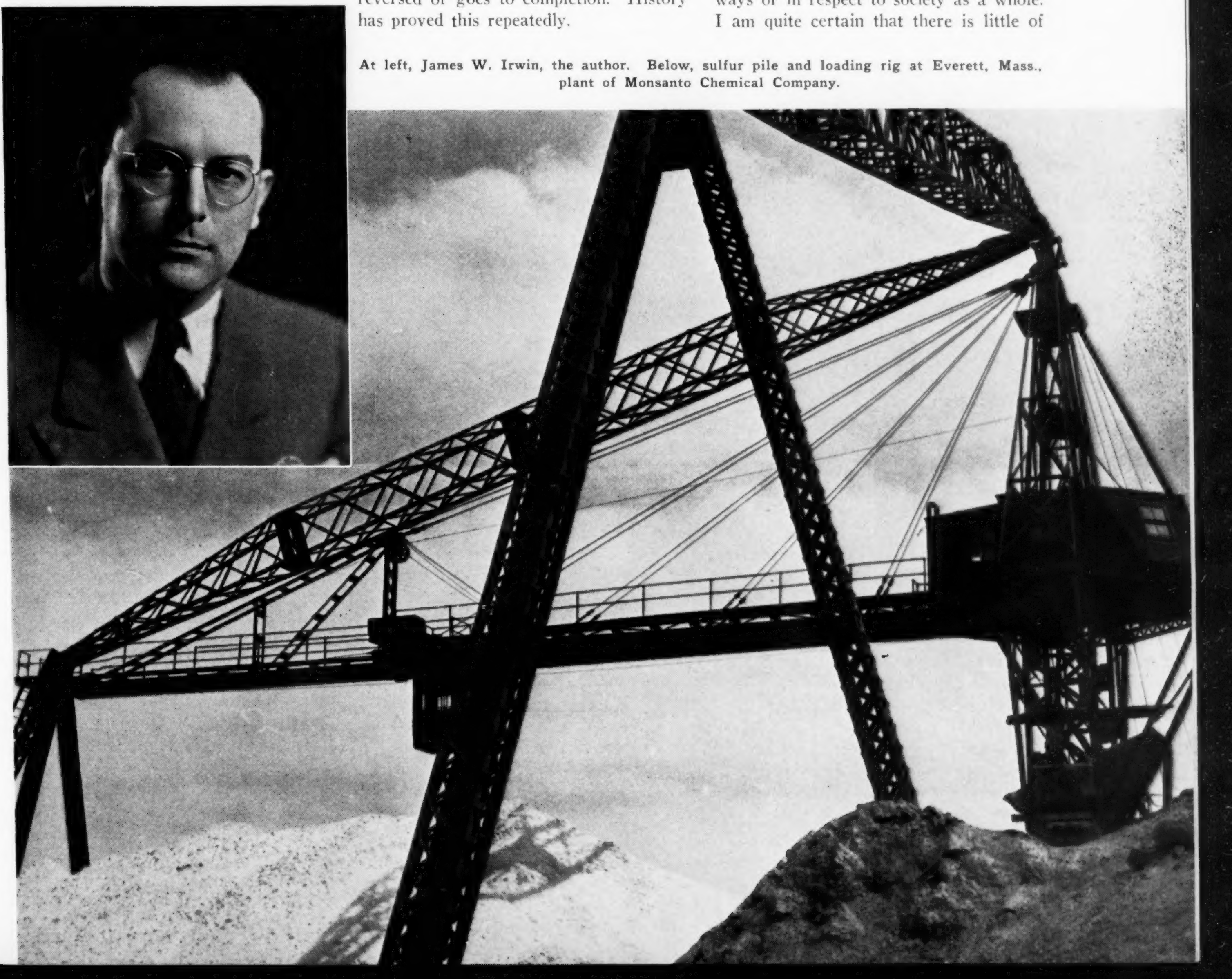
I personally feel that there can be no half way compromises between these two systems, no modification of one to include the best elements of the other. The period of transition from one to the other may be sudden, or it may be gradual, but there can be no stopping in between. Once the movement is started it is either reversed or goes to completion. History has proved this repeatedly.

That is the reason I believe that *all* Americans—and I will get down to the specific case of chemical engineers shortly—are faced today with an extremely important problem. The movement toward collectivism, toward totalitarianism, toward state socialism, or in other words the movement against free private enterprise, is taking place all about us. The signs, which you know as well as I, are unmistakably both within and without our national boundaries. And the movement is gathering momentum. The people of America today are faced with the task of reversing a trend while there is yet time, or the alternative of being swept along by the tide to a way of life that I am convinced the majority of them do not or will not want.

Now what does all this have to do with chemical engineers and chemical engineering? What, if any, is the stake of chemical engineers in free private enterprise?

Let me say right now that there are many people in this country, and among them some who are respected for their judgment and keen analytical ability, who are not so sure but what science and engineering may be one field that would benefit under state autocracy, regardless of the desirability of this system in other ways or in respect to society as a whole. I am quite certain that there is little of

At left, James W. Irwin, the author. Below, sulfur pile and loading rig at Everett, Mass., plant of Monsanto Chemical Company.



this attitude within the scientific professions themselves, although all of *you* are in a better position to be a judge of this than I am. By far the majority of my business and outside contacts are with people outside of the technical professions, and they range all the way from corporation heads to taxi drivers and newsboys. In fact, I try to make it a point continually to keep in touch with the thinking of people of all walks of life as far as it is possible for a single person to do. Not only is this a part of my job, but I get a tremendous amount of enjoyment out of it.

It is on these many contacts *outside* of the scientific world that I base my previous statement. I don't mean to be a bearer of alarmist propaganda. I don't mean to say that the rank and file of America is going Fascist or Communist, or even that any large proportion of these people look upon science and technology as doubtful beneficiaries of free enterprise and democracy and hence upon scientists and engineers as doubtful supporters of these systems. I only wish to report to you that I have heard people say, usually somewhat regretfully and mournfully, that maybe it will be necessary for this country to go over to government regimentation of science and industry, deplorable as its other effects may be, in order to keep up with the technical achievements of totalitarian states. There's no use kidding ourselves, they say. Property and honor are safe only when guarded by strong hands, and it is science—not courage—which gives strength today.

And then there are those in a still further removed group who point out that the "stimulus"—and I quote "stimulus"—of totalitarianism has a more beneficial effect on scientific progress than does individual initiative; that even the stress of occasional war—deplorable as it is in other respects—can serve to enrich scientific knowledge so that it will be better able to provide new and greater peacetime benefits for the people.

### Super-Saturated With Facts

In the words of one of my technical friends, research according to this thinking has a tendency to become supersaturated with facts and data during peacetime, and the jolt of an emergency now and then is needed to bring about fruitful crystallization. I have had the effect of the first World War on chemical progress in America pointed to in support of this view.

Though now but a faint flicker on the horizon, and representative of an insignificant part of our population you may say, this line of thinking is nevertheless one that we cannot afford to ignore. Especially is this so in view of the flame fanning and fuel adding effect of the many current indictments against free enterprise which are made in the name of justice to the public and to the hard working scientist and technical man. I refer to the alleged suppression of patents, private exploitation of science for profit instead of public good, misdirection of scientific effort, useless duplication of research by competing companies, absence of recognition and reward for the inventor and discoverer. All of these points are being used—and very frequently unwittingly—to help propagate a philosophy which says that *neither* the public nor scientists and technologists have anything but a ***negative*** stake in free private enterprise.

There are concrete evidences that this philosophy is having an effect on both public and legislative thinking today. We are already seeing one of the first attempts at governmental direction of science effort in the states of Maryland and Minnesota, where statutes have been passed which place a tax on all labor saving inventions; also in the proposal early this year by one of the United States Senators that Federal legislation be passed which would tax all inventions that in the judgment of the Federal government were socially "bad" because they created the "unhealthy" situation of allowing one man to do the work of two or three. General adoption of such restrictions is, I believe, one of the things that might be expected under government control of science and industry.

### Business Baiting Ads

Still another popular conception of the technical man's stake in private enterprise is represented by an advertisement of a well known peace organization which received wide circulation in national magazines about three years ago. Many of you here will remember it, because it was commented upon editorially by one of your chemical journals. The advertisement showed a full color picture of a bright-eyed, intelligent looking specimen of young American manhood working in front of a complicated piece of chemical apparatus. The caption read "Top man in his class," and the story following told how this brilliant young chemist had been lured by profit-hungry, war-mongering industrialists to put his superior ability to work discovering new and more deadly weapons to use against his fellow men instead of new drugs with which to cure their ills or new conveniences for peaceful living. Though the cry of war monger has been silenced somewhat under the current swing of public sentiment in support of bigger and better national defense, there are still evidences of the public's fallacious belief that munitions makers are intent on dragging us into the current war and that they are exploiting some of the country's best technical brains to help them achieve their selfish ends.

I have brought you these observations for a purpose. That is to show you that there is some reason for considering here today the question of the chemical engineer's stake in free private enterprise. I can only present a picture of that stake as I see it as an outsider, and as I have seen it in my frequent contacts with chemical engineers during the short time I have been associated with the chemical industry. There are probably some in the audience who could do a better job of presenting the picture as pertains specifically to chemical engineers than I can. But I hope that my brief remarks will cause some of you at least to give the matter your most earnest thought, and to realize that its disposition is not something for politicians and statesmen alone, but for doctors, lawyers, engineers, scientists, merchants, workmen, and every group who has any stake and influence in our country as it is today. I hope that you will consider the problem in your own minds in true scientific fashion. If you decide that the system of free private enterprise stands up under this kind of analysis, and I feel confident that it does, then I hope you will consider it important enough to you, to your profession, and to America, to defend it in every way that you can.

As I see it, here is your stake in free private enterprise as chemical engineers.

First, there is your existence as a profession, and all that is implied by this—your code of professional ethics, your requirements for recognition, your strength and influence in shaping the course of future chemical engineering developments, and, in fact, your influence in determining the extent and direction of the technological progress of the United States.

Under collectivism—regardless of the particular outward shape it may take—I believe you can be reasonably certain that ethics will be replaced by laws. These laws will be drawn up by men answerable to a political body rather than to chemical engineers or even to those who use chemical engineering services. Likewise, I believe that you can expect your standards of practice and your licensing system to be placed under political control. State licensing will not be as you know it today, where your own and other professional engineering societies have a voice in drawing up and administering licensing laws. It is not difficult to envision the result of allowing responsible jobs in science and engineering to be filled through the spoils system, not to mention the demoralizing effect on men of real ability and on young men aspiring to higher positions.

In the ten years of my association with industry I have come to have a great deal of respect for the technical men, the chemists and chemical engineers who create new products, new processes, and translate them into mass scale production and public benefit. I also have tremendous respect for those of their number who have reached high executive positions in industry, and I am positive and without

doubt that these men could not have done what they have for chemical industry, its employes and the consuming public without benefit of chemical engineering *as a profession* as well as a science. Gentlemen, I believe that your *very profession* is one of your greatest stakes in free private enterprise—your professional pride, your professional freedom, your right to serve true progress instead of a dictator.

### Science and Democracy

History has recorded time and again that all forms of science are more at home in the climate of democracy and free enterprise. In many of its branches, science under the democracies can justly claim world leadership. That leadership now promises to be continued by the arrival on our shores of some of the possessors of Europe's best scientific brains who are exiles from the laboratories of the dictator nations. In most of our great endowed research organizations, made possible by the profits of private enterprise, and even in many of the laboratories maintained by our large corporations, there is, especially for certain gifted individuals, liberty of investigation amid the most favored surroundings. If any in the audience are in government work, you know better than I that all of the government's scientific efforts under a democratic system are not bent toward making guns, powder and materials of war with which to achieve power or maintain it. Despite the windings of red tape, fundamental work in the control of disease, the conquest of environment, the very origins of life, goes on apace. You who are on the staffs of colleges and universities do not kowtow to government officials, are under no obligation to make your experiments prove the validity of the dictatorship of the proletariat.

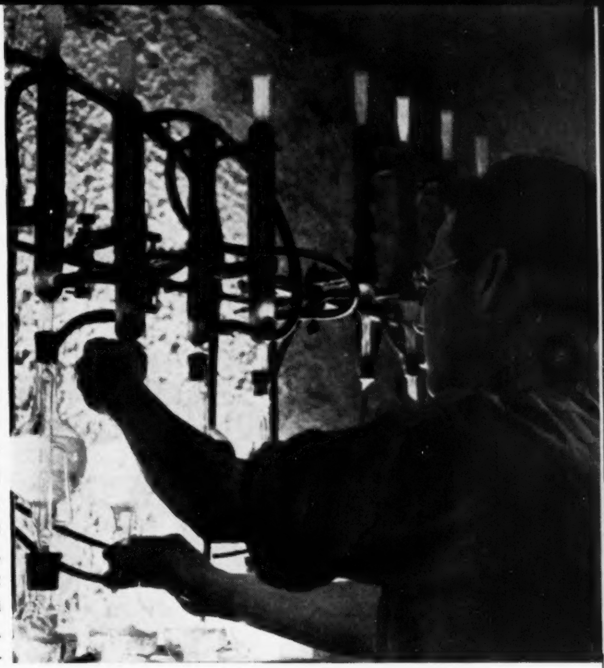
Further, if you have faith in a new idea you have the privilege of submitting it to other judges if the first one turns it down. This is not true under state socialism. The government's word is final. There is the story of Chauncey Depew advising his nephew not to invest $5,000 in Ford Motor in the early days "because nothing has come along to beat the horse," and Mr. Depew was considered an expert on investment. Or the time George Eastman, then a teller in a Rochester bank, approached one of the bank's clients for $5,000 to put into his Kodak, and was turned down with a laugh at the thought of risking so much money on a "box with a hole in it." Can we expect government officials to be any more competent in their judgment? Arthur Garfield Hays, the well known author, replies in the answer to his rhetorical question, "What is government anyhow?" "In practice," he says, "it is some individual clothed with power. He is not omniscient; he seldom is willing to accept responsibility . . . The official has much to lose if his decision is wrong; little to gain if it is right. Even in the United States . . . the traditional governmental method is to pass the buck. Can the official afford to take a gamble, or if he can, will he?"

Finally there is that reward that comes to every person who has a hand in making something that people are willing to pay for voluntarily—that inner satisfaction of having achieved something that your fellow man wants because it contributes to his happiness, comfort or security and not because some overlord decreed it. All reward is not material.

As to the chemical engineer's future stake in private enterprise and democracy, I can see a continuation of the dynamic advance that has characterized American chemical technology during recent years. I can see the science of chemical engineering broadening its scope of importance in our industrial and manufacturing system and continuation of the increasing demand for chemical engineers in fields outside the chemical process industries. I can share Dr. C. M. A. Stine's vision of men with technical background filling more and more of the positions in high industrial management, positions that require both depth and breadth of view and wide technical appreciation. I see these men and others all down the line of the technical professions enjoying the pride and satisfaction of achievement through their own efforts and direction.

### Individual Duties

In closing let me point out briefly several ways in which you as individuals in your daily duties can help share the burden of home defense of free private enterprise and combat the forces of creeping collectivism. You are already contributing to the bed rock of this defense in the carrying out of your daily tasks, for it is on its superior ability to create for the good of all mankind that the whole case for free enterprise rests. You are already helping to make this product that we here in America believe in and are trying to sell and keep selling. That, of course, is the most important consideration, but it is not the whole job. Ideas and systems of economy do not sell themselves, no matter how perfect they appear to be, and our free enterprise system is a long way from perfect even in the eyes of those who are its most loyal adherents. The point I am trying to make is that there are two sides to everything, and if the opposition can make their side appear the more logical or the more attractive they are the winners for a time at least, regardless of the rightness of our own stand. That is why I say that private enterprise today needs some good salesmen, and engineers and technical men can be some of the most effective salesmen I know of provided they know their product and are sold on it themselves.



Research laboratory at Norfolk, Va., plant of Monsanto.

Here are a few of the ways in which you as chemical engineers can help sell private enterprise:

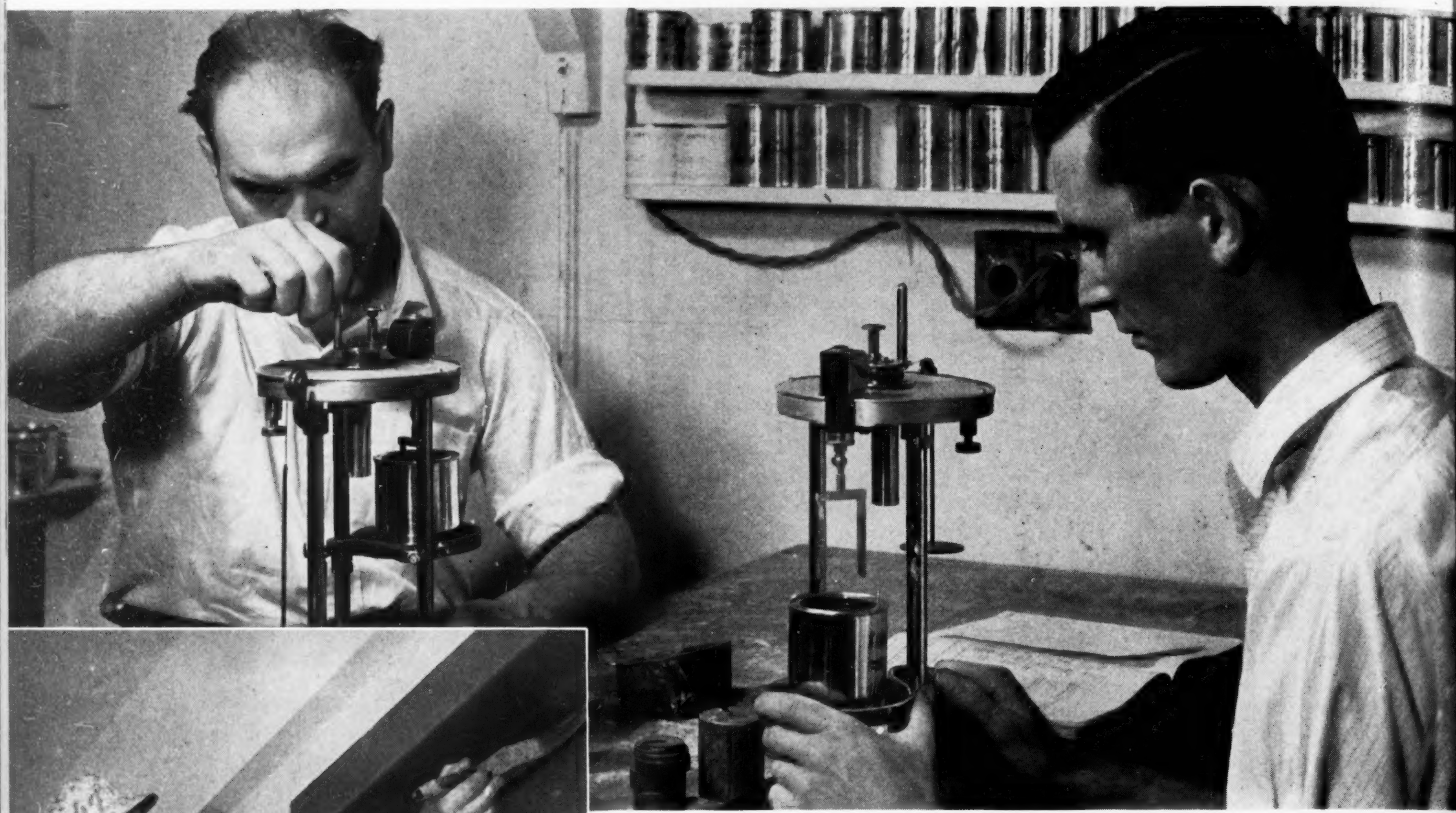
Establish and then reinforce your own thinking on the subject so you can discuss it intelligently when it comes up as a topic of conversation among your friends and colleagues. Try to make it a point to keep sufficiently informed so that you can back up what you say with evidence.

Try to find time to accept occasionally when the invitation comes to you to speak before civic, church or other community groups. Let people know about some of the things industry does. Show them, when you have the opportunity, that the people who make industry are not magicians or supermen or schemers, but are common ordinary hardworking folk like themselves. You don't have to be an orator to do this. All you have to have are some thoughts and ideas and then put them into words so others will understand them.

If you read an attack on private enterprise in the editorial columns of your newspaper, or if you hear an attack on private enterprise from the pulpit of your church or any other source, you can take the next opportunity you have to present—in a courteous manner—your side of the picture to the person responsible. Perhaps this may even take the form of a letter to the editor, or a remark to a friend that you didn't agree with what he said on a certain occasion.

And finally, to those of you who are actually engaged in private business, you can aid the cause of free enterprise by doing everything in your power to set your own house in order, by seeing to it as far as you can—especially if you are in a management position—that your own business is being conducted on a humane and ethical as well as efficient basis so that as a representative of free private enterprise it can come into the court of public opinion with clean hands.

# ZINC OXIDE—Its Paint Making Properties



Operating in much the same manner as a painter stirring paint, the Stormer Viscometer is one of 4 types of apparatus used in the laboratories of The New Jersey Zinc Company for control and standardization of the consistency characteristics of zinc oxide.

**Second and Concluding Section of Mr. Harley A. Nelson's Analysis of the Functions of Zinc Oxide in Paints Which, Under the Above Heading, Began in the November Issue of Chemical Industries and was Devoted to Exterior Paints. Enamels, Flat Wall Paints, Metal Primers and Marine Coatings are Reviewed Below.**

IN its pure form, zinc oxide is very slightly on the alkaline side. Under normal manufacturing conditions, the surface adsorbs reactive gases from the atmosphere, so pH measurements on water slurries of commercial products result in values ranging from 7.0 to 8.0. Since zinc oxide is amphoteric, it is a neutralizing agent for both acids and alkalies, but it is the ability to neutralize acids and acid decomposition products in the binder without the addition of a strongly alkaline material that is of interest to the paint industry. This is a particularly useful function, because these acid materials usually have detrimental effects, such as discoloring the paint film or promoting the corrosion of metals.

Ordinarily, the degree to which the reactivity of zinc oxide functions depends on particle size (see Figure 6), or more accurately on surface area, which can range from 6.0 square meters per gram of pigment in a colloidal type zinc oxide down to 0.6 square meter per gram for the larger particle sizes. The reaction products between zinc oxide and the vehicle can have diverse and far-reaching influences on paints, functioning as dispersing agents, bodying agents, suspending agents, densifying and sealing agents, and hardening agents.

Obviously, its reactivity sometimes puts limitations on the use of zinc oxide, as in the case of some synthetic resin vehicles. Realizing the valuable properties inherent in zinc oxide, attention has been given to the development of less reactive vehicles to permit the use of zinc oxide

without major consistency changes. However, the latest contribution to this problem comes from the pigment side in the form of zinc oxide with a less reactive surface, at present represented by XX-505. Because of the complexity of the vehicle situation, it is impossible to make sweeping generalizations or classify the results according to types of vehicles, but experience has demonstrated that paints of practical stability can be made with XX-505 in many cases where standard zinc oxides are out of the question. The interesting thing about this type of zinc oxide is that, according to evidence at hand, it not only produces most of the desired effects obtained with other zinc oxides, but in some cases it shows definite improvement over these.

care of, as well as mildew conditions encountered in some localities. Also, many resin type vehicles sometimes have effects on tinting materials that cause pronounced color changes even before chalking occurs. In such cases, the presence of zinc oxide often prevents the difficulty.

Another very important quality of exterior enamels containing zinc oxide that seems to apply to all types of vehicles is that their weathered surfaces are more easily washed free of dirt, and take a polish with less work than similar coatings without zinc oxide. This is important in automobile enamels. In fact, good results can often be obtained by merely wiping a zinc oxide-containing enamel with a dry cloth alone, whereas a

all types, from the colloidal to those in the coarse range, have been used successfully, but those in the intermediate particle size range are favored. However, a recent development is that zinc oxide of lower reactivity (XX-505) has shown indications of better cleansing, gloss and tint retention, which will undoubtedly make the advantages of zinc oxide available in many enamels containing more reactive vehicles.

Exterior nitrocellulose lacquer enamels represent a striking example of a case where chemical and optical properties of zinc oxide combine to produce desirable results. Nitrocellulose decomposes readily under ultra-violet light, and the decomposition products discolor the film and also catalyze the decomposition. Zinc

**In flat wall paints, zinc oxide can control consistency, leveling and sagging. The Gardner Mobilometer is often used for determining the consistency of such products.**

**The Consistency Cup is commonly employed for measuring the consistencies of enamels formulated with zinc oxide. Another type of apparatus used is the vacuum plastometer.**

Aside from general uses, such as aiding the dispersion of pigments that are difficult to disperse, improving leveling and suspension, and promoting through drying (preventing wrinkling due to top driers), the more specific functions of zinc oxide in enamel type products for exterior service are to reduce color change, improve gloss retention, reduce chalking, and improve durability in general by eliminating blistering failures. If enough zinc oxide is used to markedly reduce chalking when the other pigments present are of the free chalking type, which varies from 20% to 50%, gloss retention and color changes (yellowing and loss of tint) will be taken

zinc oxide-free enamel requires both polishing and waxing. In some vehicles, this advantage will show up with as little as 15% zinc oxide.

Where baking of the finish is involved, the particularly useful functions of zinc oxide are to obtain uniform hardening throughout the film and to retard color change (yellowing) during the baking operation. These purposes can sometimes be accomplished with as little as 10% zinc oxide but other considerations, as mentioned above, generally favor higher percentages.

Good exterior enamels can be made with a wide selection of zinc oxides and

oxide breaks up this cycle both by intercepting the ultra-violet radiations and neutralizing the acid decomposition products.

Nitrocellulose enamels as made today usually carry modifying resins. Where resins such as ester gum and dammar are used to modify the nitrocellulose, the presence of an appreciable amount (25% or more) of zinc oxide is still important because of their susceptibility to ultra-violet light. From the standpoint of durability the percentage can be reduced when alkyd resins are included, but for easier cleaning and polishing, reduced blistering failures, and the usual other ad-

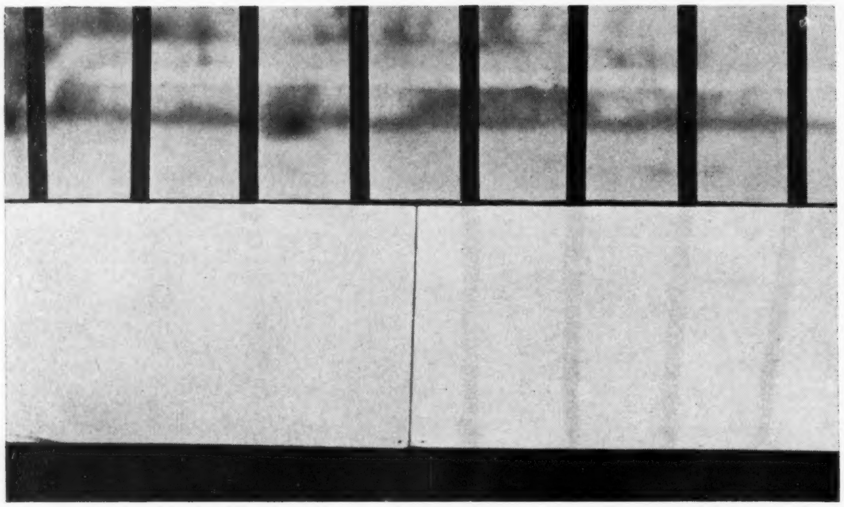


**Fig. 13.** Contrasts in gloss retention of interior gloss whites after three years on a wall under normal room conditions. The better gloss retention is represented by the greater definition of the reflection of the black bars. Panel on left is gloss without zinc oxide. On right, with zinc oxide.

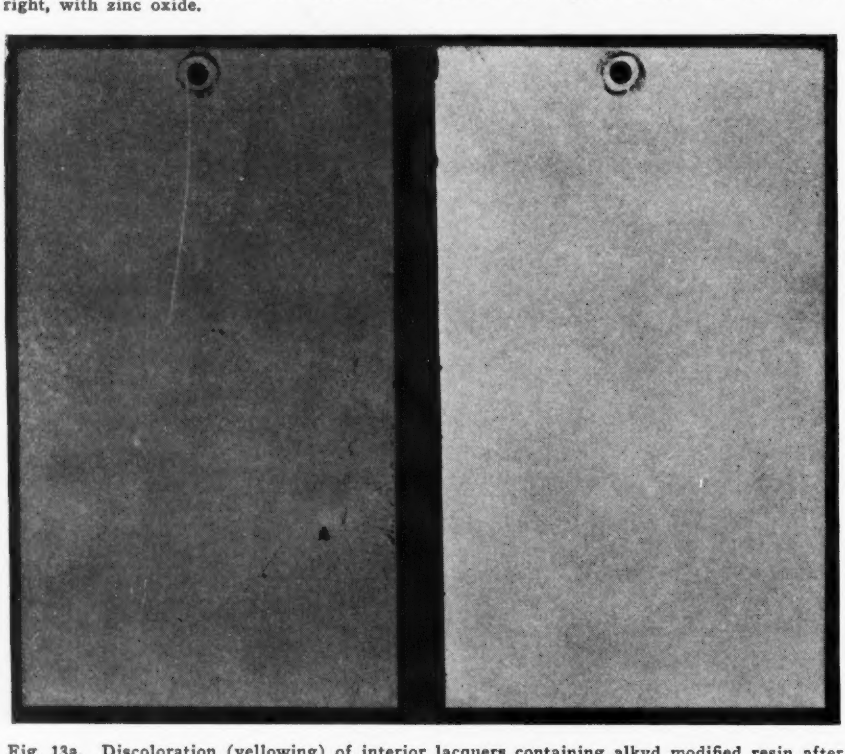


**Fig. 13a.** Discoloration (yellowing) of interior lacquers containing alkyd modified resin after six years on wall. Left panel, 100% $TiO_2$. On right, 50% $TiO_2$, 50% ZnO. The presence of zinc oxide serves to neutralize the colored and more or less acid products that are normally formed when drying oil and resin films age.

vantages, zinc oxide should be present to the extent of 15% to 25%. In these exterior enamels highly reactive, fine particle size zinc oxides are likely to prove too drastic. Best results are obtained with the less reactive types.

In flat wall paints, zinc oxide serves to control consistency and improve resistance to washing, yellowing, and mildew. Because of its reactive surface and the soaps that can be formed with it (depending on the vehicle), zinc oxide can act strongly to produce either flocculation or dispersion of the pigment in the vehicle. It is frequently desirable to use zinc oxide in paint for this property in order to balance the effects of other ingredients. The desired adjustments to obtain improved body, leveling, non-sagging and suspension can be made by proper selection of the zinc oxide since it is available in a wide range of particle sizes, shapes, and degrees of reactivity.

Where oil varnish architectural finishes are involved, zinc oxide can serve all of the purposes that have been mentioned in connection with wall paints. With interior enamels, however, there is such need for emphasis on properties obtained with zinc oxide that higher percentages are desirable all along the line. The best examples are the long oil enamels made with the highest grade French process type zinc oxides with their excellent packaging qualities, good leveling, holding-out qualities, high gloss and gloss retention, good color, resistance to yellowing or change in tint, and washability. All of these combine to produce products with such enviable service records that they still set the standards for more recent developments in faster drying and higher hiding products. In fact, the present problem is to retain as many as possible of the good qualities of these enamels and still meet modern demands for speed. With zinc sulfide and titanium dioxide available, it has been possible to step up hiding power by adding 10% to 25% of these high hiding pigments to the zinc oxide without seriously disturbing other properties. The endeavor to use synthetic resins for speeding up drying without disturbing other properties of enamels has been a more complicated problem.

Gloss retention of high grade, air-dry, synthetic finishes is a live question. As the reactivities of the vehicles have permitted, small amounts (2% to 10%) of the more reactive zinc oxides have been used with distinct improvement in the results in many cases. (See Figure 13.) However, very favorable results are now being obtained with recently developed, less reactive, synthetic resin vehicles, in which zinc oxide can be used as 25% to 75%, or even 100%, of the pigment. Where the vehicle has poor wetting qualities, the addition of zinc oxide will aid in the dispersion of pigments that are not readily dispersed. In such cases, 40% or more of a reactive zinc oxide will often produce the maximum gloss results with the minimum amount of milling.

The ability of zinc oxide to eliminate or minimize yellowing of synthetic resin enamel films when exposed to diffused light, as in a room (see Figure 13-a), is even more marked than when such films are exposed to direct sunlight. To obtain maximum results 15% to 20% zinc oxide should be used. For this purpose, the normally reactive zinc oxides of the French process type are usually most efficient but, where the vehicle is too reactive, the possibilities of less reactive zinc oxide (XX-505 type) should not be overlooked. The amount necessary for obtaining results with any given zinc oxide depends on the vehicle and the resin it contains. Here, again, the presence of zinc oxide contributes to color stability and good general film properties if 10% to 20% is present.

### Baking Primers

In enamel finishes designed for baking, the two major functions of zinc oxide are to help obtain uniform hardening throughout the film, and to retard yellowing during the baking operation and later in service. In addition, zinc oxide generally contributes improved pigment suspension, leveling and gloss. The amounts needed depend on the nature of the vehicles, especially the resin that is used. In general, vehicles with higher oil con-

tent require more zinc oxide, but are quite responsive to its presence. Ten per cent to 25% zinc oxide is the useful range for average products, but for vehicles with the more reactive resins, even 2% to 3% may produce surprising improvements. Because of the importance of color, the better French process type zinc oxides are mostly used, and in some formulations successful use has been made of the very reactive (Kadox) grade, which is colloidal in nature.

In baking primers, also, zinc oxide is an essential where sealing and blister resistance under exposure to moisture are necessary. For example, it is well known that the ultimate results in blister resistance of refrigerator finishes exposed to sweating or condensation are obtained with a zinc oxide-synthetic resin type primer in which the percentage of zinc oxide is maintained as high as circumstances permit. The moderately reactive zinc oxides are generally used in such products.

The versatility of zinc oxide in the metal priming paint field lies in the fact that it can function as a practical suspending agent for the heavy priming pigments while it also contributes weather resistance and, in addition to being in the inhibitive class, aids the other inhibitive pigments by counteracting undesirable acid conditions within the film.

There really are two classes of primers for steel, namely, the so-called shop coats, and those over which finish coats are applied at once. Shop coats must be designed to withstand the weather under a variety of yard storage and erection conditions for periods up to possibly two years, or even more. This fact, and the fact that some of the best inhibitive pigments are notoriously susceptible to

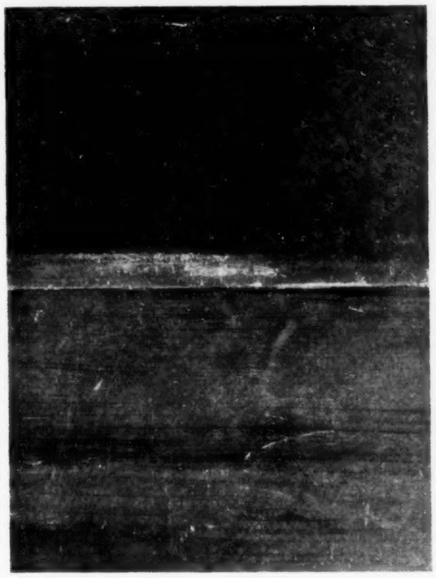
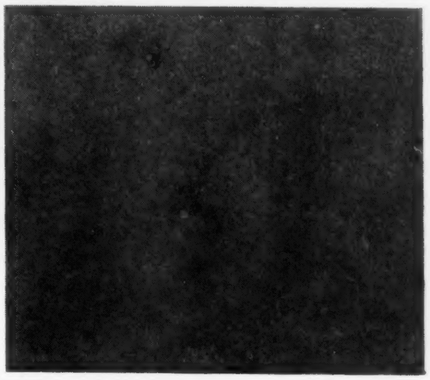
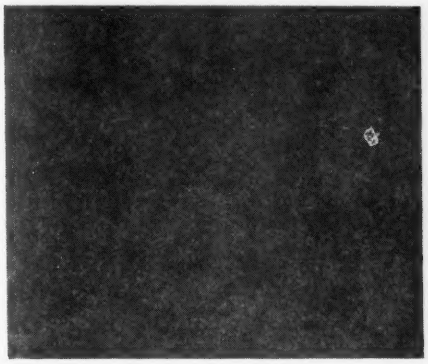


**Fig. 14. Improvement in weathering and rust inhibiting qualities by adding zinc oxide to lead chromate shop coats and primers. Above panel, 100% lead chromate, paint blistered and badly pitted. Below, 80% lead chromate and 20% zinc oxide. Both panels are 1-coat applications exposed 7 years at 45°.**

**Fig. 15. Improvement in weathering and rust inhibiting qualities by adding zinc oxide to zinc chromate primers. Right, 65% zinc chromate, 35% magnesium silicate. Below right, 60% zinc chromate, 20% zinc oxide, 20% magnesium silicate. Directly below, 35% zinc chromate, 35% zinc oxide, 30% magnesium silicate. All 3 panels are 1-coat applications exposed 4 years at 45°.**





weather, make the inclusion of zinc oxide in shop coat formulas a logical step. Fifteen per cent. to 20% zinc oxide (based on total pigment) is usually sufficient to build up the weather resistance to a practical degree. However, in the case of the chromate-type primer pigments, the weather resistance is relatively low and the avoidance of acid film conditions so important that the use of as much as 30% zinc oxide should be considered, as suggested by the results shown in Figures 14, 15 and 16. In these cases, the marked reduction in blistering type of failure when zinc oxide is added deserves special attention.

The marked effect of zinc oxide on a relatively non-inhibiting but weather-resistant paint is best illustrated by the improved results when about 20% zinc oxide is added to iron oxide, as shown in Figure 17. When such combinations are further stepped up by substituting other inhibitive pigments for iron oxide, as in the case of zinc dust, in proportions to produce a combination such as 50-20-30 zinc dust-zinc oxide-iron oxide, the results are highly satisfactory from a practical point of view. This represents a principle for formulating weather-resistant, inhibitive paints which will, moreover, produce better results with any pigment in the inhibitive class.

In special primers of the zinc dust type for galvanized iron, zinc oxide (20%) is added primarily to serve as a suspending agent for the metallic pigment. The use of zinc oxide is preferred because it has no serious effect on the adhering qualities. Similarly, zinc oxide can be used to good effect in zinc chromate primers for finishes on magnesium and aluminum alloys.

Finish coats for metals for industrial parts and structures must be designed to meet a wide variety of conditions and often require special formulation. However, formulations of the type used for general exterior service give excellent service under average conditions, provided they are fortified with sufficient zinc oxide to take into account the more rapid chalking and erosion that usually occur on metal surfaces. This is particularly true over primers containing pigments like lead that have the effect of driers and promote oxidation of the binder that comes in contact with them.

It is generally better to avoid using the highly reactive, fine particle size zinc oxides in maintenance paints for metal. While neutralizing power of the zinc oxide in the paint film is important, it should obviously be tempered to last over an extended period, and the use of larger amounts of the less reactive zinc oxides is a sounder basis on which to formulate. Either nodular or acicular types may be employed.

The mild but effective fungicidal action of zinc oxide gives it a unique position among white pigments. However, the fact that zinc oxide acts fungicidally toward vegetable growth must not permit this to be confused with the property of toxicity. Zinc oxide is in no sense toxic; it is used in a great many medicinal and cosmetic preparations.

The effectiveness of zinc oxide for controlling mildew growth cannot be ascribed to reactivity in the sense that it results in soap formation and surface hardening effects on the paint film. Investigators now generally accept the view that the small amounts of water soluble zinc salts formed by reactions with impurities in the atmosphere and acid decomposition products from the binder are sufficient to account for the results. Most fungi will not grow in contact with zinc oxide, which fact is now taken advantage of in other fields, as by adding it to the surface soil to control fungus attacks on young plants ("damping off"). Where bad mildew conditions have previously existed on a repaint job, it is particularly desirable, in addition to proper preliminary washing, to have plenty of zinc oxide in both coats. Figure 11 shows how mildew con-

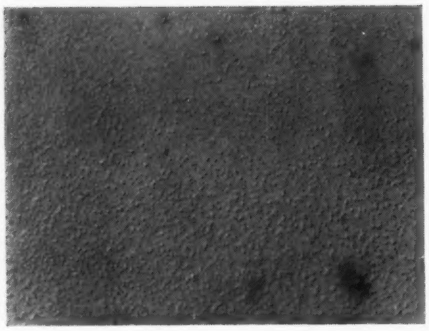
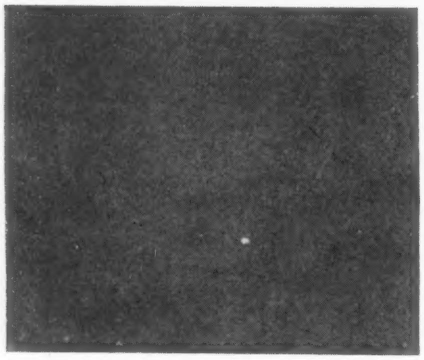


Fig. 16. Improvement in weathering and rust inhibiting qualities by adding zinc oxide to zinc chromate—iron oxide shop coats and primers. Above, 35% zinc chromate, 30% magnesium silicate, 35% iron oxide. Below, 35% zinc chromate, 30% zinc oxide, 35% iron oxide.



trol improves with the percentage of zinc oxide in the formula.

Zinc oxide is equally effective in interior paints of all types for use in damp locations, bakeries, breweries, etc., as illustrated by Figure 18, showing results on mill gloss paints with and without zinc oxide when exposed to bad mildewing conditions.

The combination of corrosive salt water, fungus growth, strong sunlight, and high humidity conditions long ago led to the practical discovery that the presence of zinc oxide is desirable throughout the entire range of marine and underwater paints—from anticorrosive primers and anti-fouling paints to finish paints and enamels—as exemplified by the instructions for painting vessels of the United States Navy. Many interesting efforts have been made to take special advantage of the properties of zinc oxide in the marine painting field. One example is the practice followed by the United States Coast Guard, and others, of applying a zinc oxide-gum turpentine mixture (5 pounds to 1 gallon) as a primer on all underwater areas that are touched up in the dry dock in order to neutralize the surface and prevent pitting under the repaint.

The exacting requirements of modern seaplane service, as recognized by the British Royal Aircraft Establishment, are again calling attention to the usefulness of the fungicidal properties of zinc oxide. Besides being generally desirable as part of the pigment in both undercoats and finishes, to discourage the adhesion of algae and barnacles, zinc oxide used in water-resistant smears or pastes that can be rubbed on susceptible areas, such as pontoons, has proved distinctly helpful.

For general service, wherever a higher hiding pigment that produces a soft, chalking type of film is to be used in marine paints, the percentage of zinc oxide should be increased 10% to 25% over the percentage that would normally be used in the same type of formula for service on land. Under tropical exposure conditions, 75% to 80% of zinc oxide with a high hiding pigment can often be used to advantage for resistance to chalking, abrasion (washing), and fungus growth. Zinc oxides of the American process type that are designated for general exterior service are most satisfactory.

Explanations based on the better known properties of zinc oxide have seemed inadequate for some of the effects obtained with it, the most notable example being the better gloss retention and general weather resistance of the surface film of binder associated with exterior paints containing zinc oxide. The evidence apparently rules out zinc soap formed in the film as being the effective agent. Likewise, since a film of oil lies over the top pigment layer, the recognized opacity of zinc oxide to ultra-violet light cannot offer an explanation. However, during the past ten years, the literature on catalysis in synthesis of alcohols, etc., has referred to the use of zinc oxide as a catalyst. From this it has been suspected that zinc oxide might act as a polymerization catalyst in paint vehicles. Preliminary tests have given reasonable evidence that such reactions are promoted in zinc oxide paint films and can be distinguished from the effects of zinc soaps.

The idea that zinc oxide can serve as a polymerization catalyst is highly important in view of the general desirability of polymerization changes in oils and resins, as contrasted with the undesirable effects of oxidation changes. Examples that are well known are the better resistance to water and to weather of polymerized oils and resins and of baked (heat polymerized) films.

It has long been known that the presence of zinc oxide results in the formation of firmer films that are more uniformly dried throughout, and this property can be used to advantage whenever, for any reason, oils with limited hard drying properties must be used in larger amounts to replace oils with special characteristics such as are found in chinawood oil. The evidence of this property of zinc oxide is very marked, although zinc cannot be classified as a drying metal in the sense of being an oxygen carrier. Recently, many interesting observations have been made on the beneficial effects on drying obtained with oil soluble zinc soaps. One conclusion arrived at is that these soaps have a peptizing action that prevents pre-

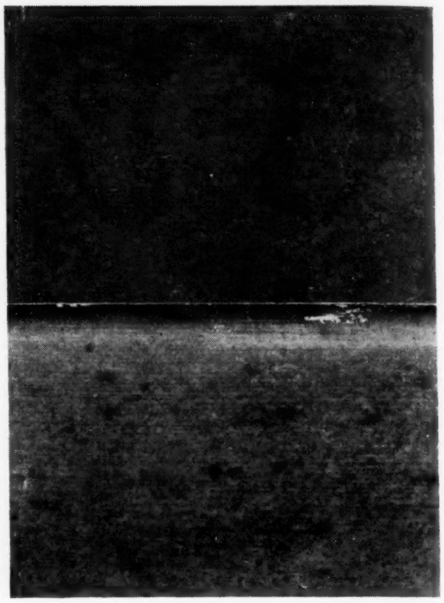


Fig. 17. Improvement in weathering and rust inhibiting qualities by adding zinc oxide to iron oxide shop coats and primers. Top, 100% iron oxide (paint is completely eroded away). Bottom, 80% iron oxide, 20% zinc oxide. Both panels are 1-coat applications exposed 7 years at 45°.

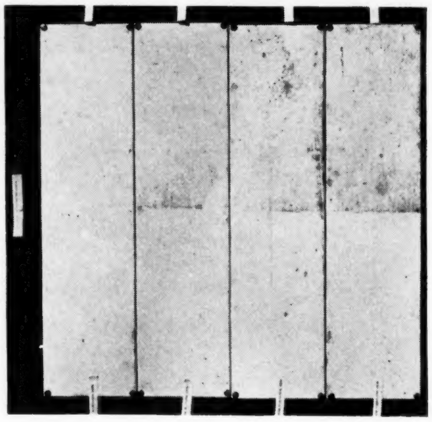
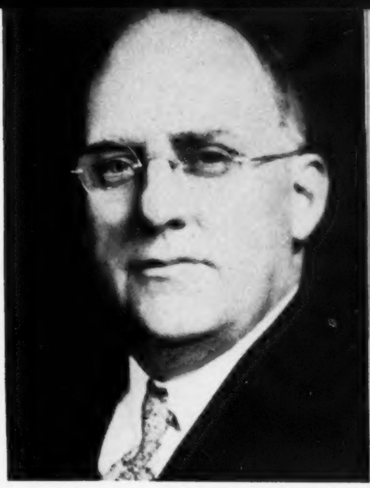


Fig. 18. Effectiveness of zinc oxide for controlling mildew on interior mill gloss paints. The top half of each panel is without zinc oxide, while bottom halves contain 25% zinc oxide. Panels left to right, contain (first) zinc sulfide, (second) zinc sulfide-barium pigment, (third) titanium dioxide, (fourth) titanium-barium pigment. Panels were exposed in a mildew test cabinet.

cipitation of the drier and thus promotes better distribution of the drier throughout the film. Another conclusion is that, because the initial surface set is retarded, the film is kept "open" with the result that there is opportunity for uniform through drying that reduces surface wrinkling troubles. From these views, it would be assumed that this is a case where the reactive property is a determining factor, and the general experience is that the most marked effects are obtained with the more reactive types of zinc oxide. However, since the improvements obtained are so much in line with what would be expected from increased polymerization of the binder, it is reasonable to suspect that this is a case where catalysis of polymerization might also be a factor in the results.

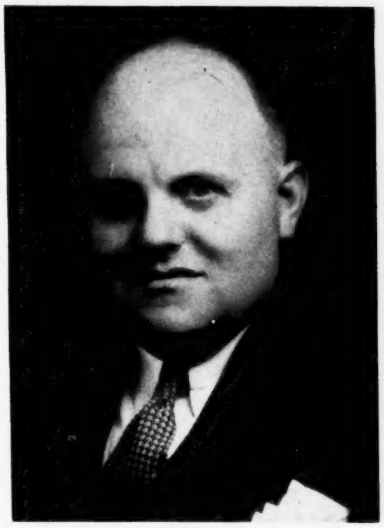
# "Headliners" In the News

James B. Gaskins has joined the technical service staff of The Columbia Alkali Corporation.



Prof. Arthur W. Hixon has been named head of the department of chemical engineering at Columbia.

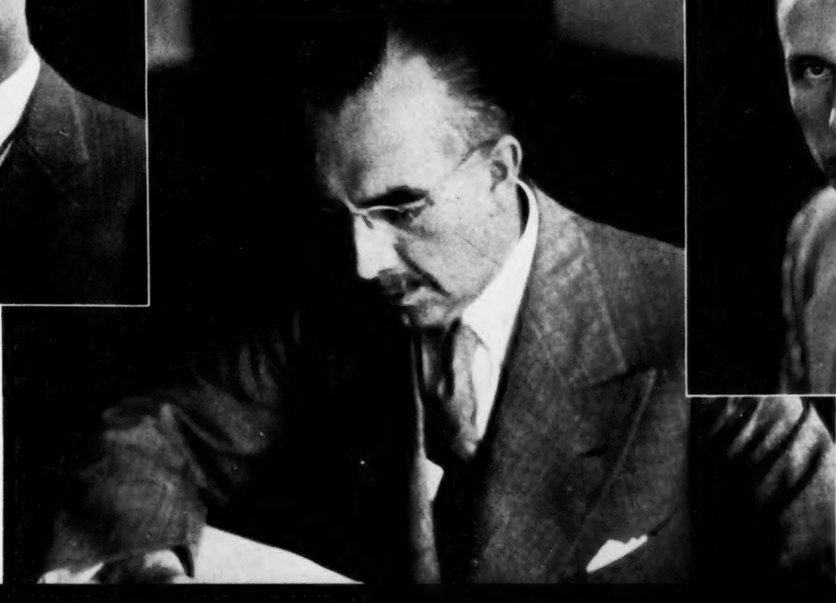
Dr. Francis C. Frary, director of research, Aluminum Co. of America, the newly elected president of the American Institute of Chemical Engineers.



Sidney D. Kirkpatrick, editor of *Chemical and Metallurgical Engineering*, who was elected vice-president of A. I. Ch. E.

Robert Lindley Murray, who has been elected director of A. I. Ch. E.

Also elected to the directorate of A. I. Ch. E. (left), James G. Vail, vice-president and chemical director, Philadelphia Quartz; (below) A. E. Marshall, president, Rumford Chemical Works, and (right), Norman W. Krase, Du Pont.



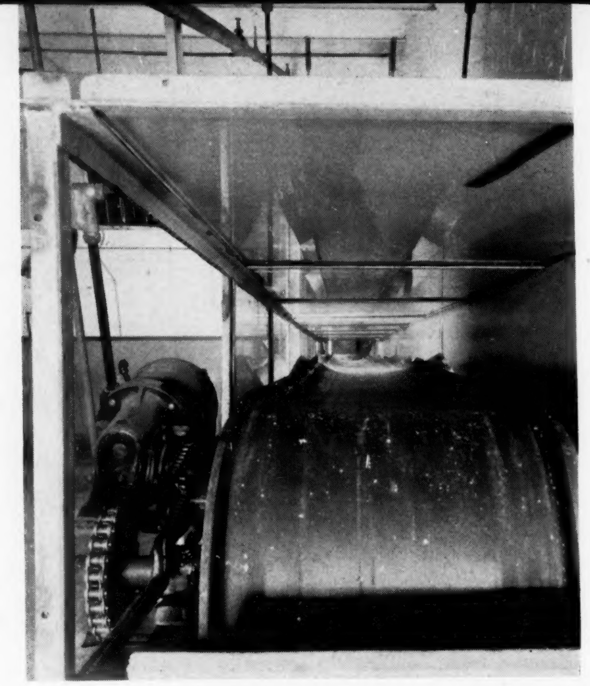
A testimonial dinner was tendered Howard Nieman, national secretary of American Institute of Chemists, by the N. Y. Chapter. Above at speakers' table are: (left to right) Marston T. Bogert, Maximilian Toch, and Mr. Nieman.

Two well-known chemical engineers engaged in serious deliberations. The "serious deliberators" are (left) Tom Ray, chief engineer, Manistee Iron works, and Konrad Fredericksen, chemical engineer, Chas. Pfizer & Co., in Brooklyn.

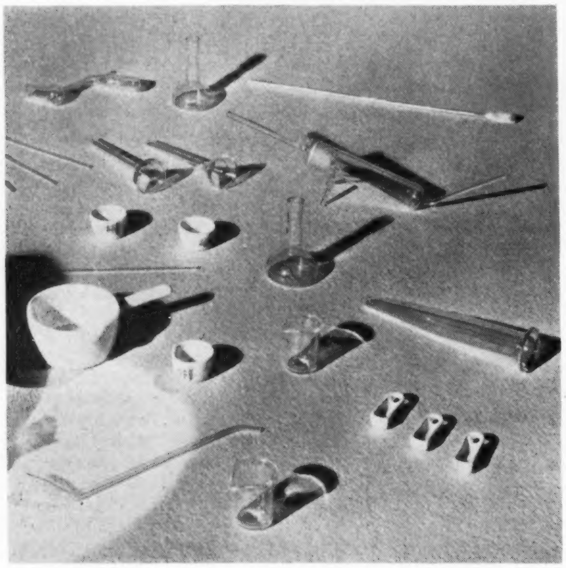
The importance of industrial health in the National Defense Program was stressed in a series of "Clinics on Health in Industry," sponsored by National Association of Manufacturers in Rochester, Wilmington, Youngstown, and Evansville. Dr. Victor G. Heiser, author of "An American Doctor's Odyssey" (right), N. A. M. consultant, discusses the clinics with (left) Dr. D. M. Shafer, associate consultant, and F. R. McGregor, executive director, N. A. M. division of industrial health.

This impressive group is composed of executives and representatives of Dow Chemical who attended the four day sales conferences held at Midland last month. In first row, kneeling, at left is Dr. Willard H. Dow, president, while Dr. Ralph E. Dorland, N. Y. manager, is in center of first standing row. Dow representatives from many foreign branches attended.

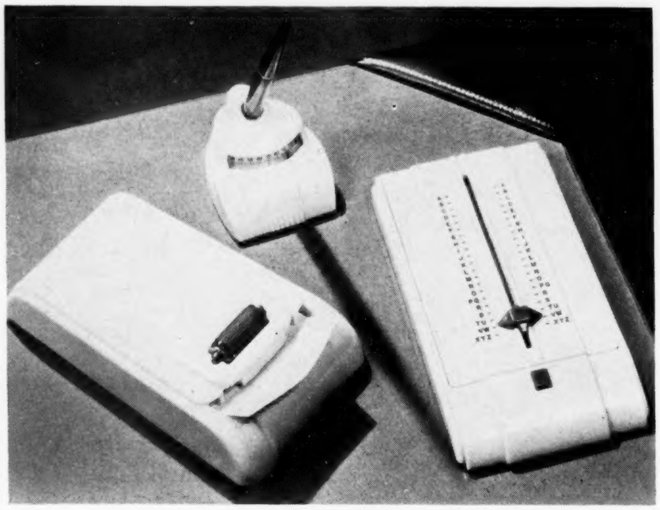
In Detroit, motor car capital of the world, automobiles are even traveling around under the earth. This one is used by foreman Edward Yipe (in car) of International Salt Company's mine dug under Detroit's west side.



B. F. Goodrich belting engineers were surprised to learn that one of their sturdy creations operates in a glass case. It is used in conveying pulp in a rayon plant, and glass case prevents loss of moisture.

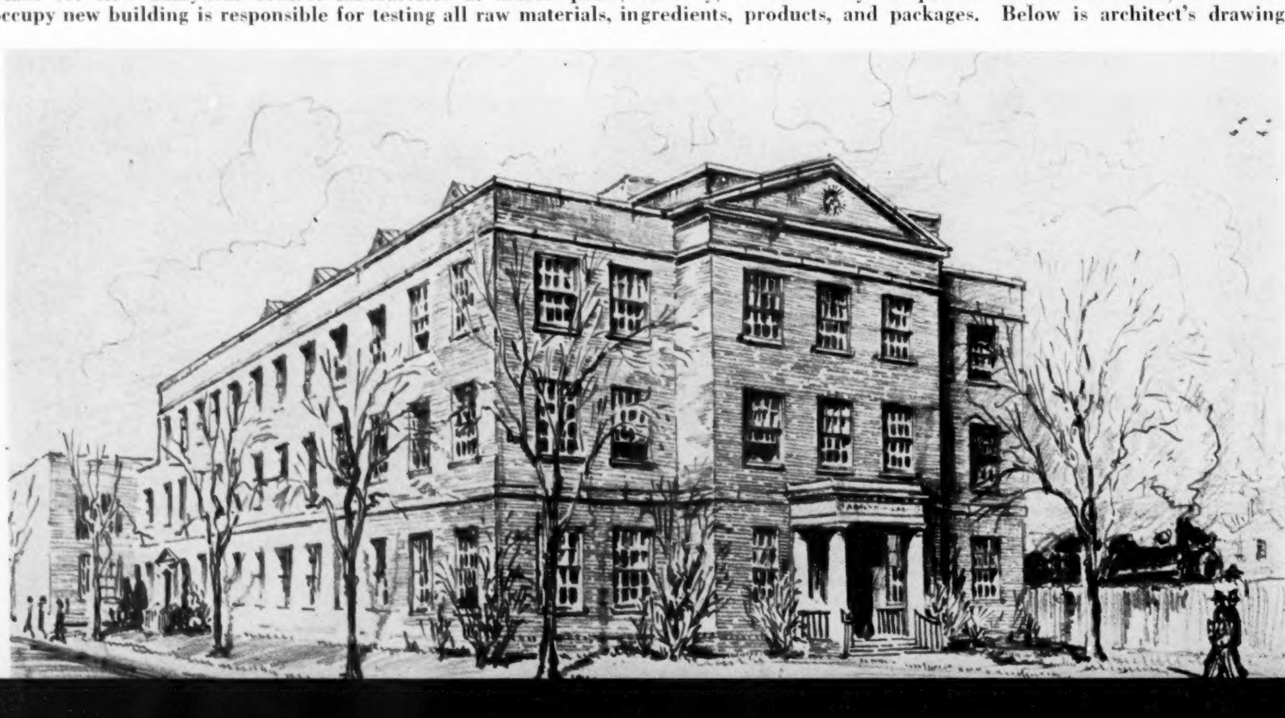


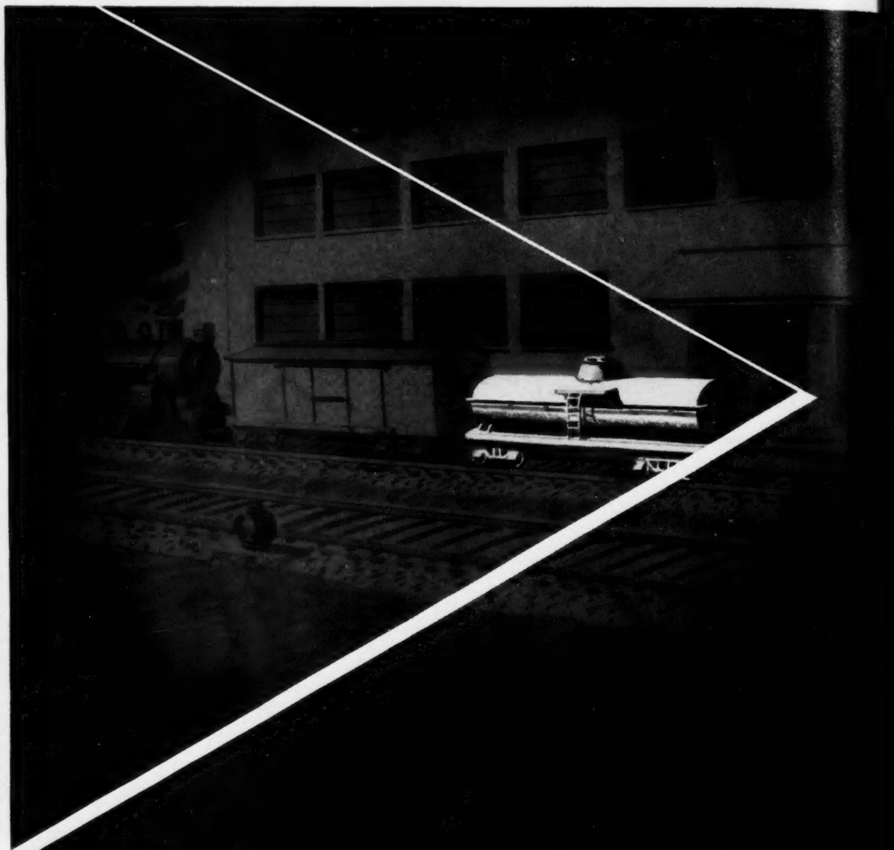
Quantities of material as tiny as one millionth of a gram are handled at microchemical laboratories of Westinghouse, through use of these tiny test tubes, beakers, crucibles, etc. Enough equipment for many chemical experiments would easily fit in the palm of one hand.



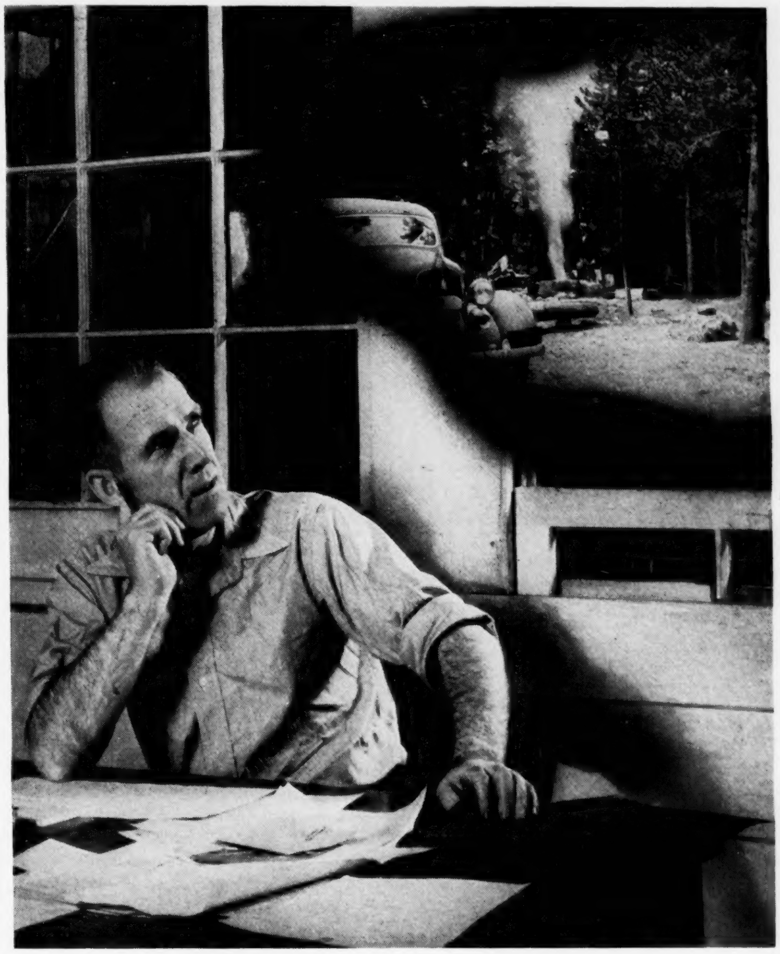
Beetle resin and molding materials produced by American Cyanamid were employed in making four prize winning entries in the fifth annual competition of Modern Plastics. Among honorably mentioned entries were these desk pieces marketed by Zephyr American Corp.

Plans for new analytical control laboratories at Merck plant, Rahway, were recently completed. Control division, which will occupy new building is responsible for testing all raw materials, ingredients, products, and packages. Below is architect's drawing.





# PLANT OPERATION AND MANAGEMENT



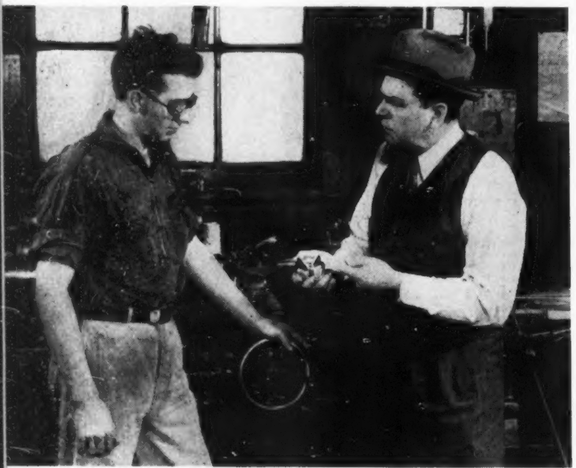
**Training Chemical Operators**

On the following pages are discussed common faults which make for inefficiency in plant production. It describes also a group of commercial motion pictures which point out the pitfalls of management and men, and show the best methods of avoiding them.

A DIGEST OF NEW METHODS AND EQUIPMENT FOR CHEMICAL MAKERS

# TRAINING CHEMICAL OPERATORS To Avoid Costly Mistakes

In the above photograph from an "efficiency" movie, superintendent (left) finds department head (right) showing one of his men how to do a job better.



In the above scene, action describes waste through use of wrong tools on a job.


Above scene shows important shipment which has failed to leave plant on time. Trouble is explained as lack of proper time allocation by supervisors and men.

**By Merritt Lum**

**The Big Question in Plant Operation is "Can a Man be Trained to Avoid Costly Mistakes?" The Author Takes up this Question at the Outset and Tells Step by Step Why the Answer is "Yes".**

CHEMICAL men have been asking themselves this question for many years. Only recently has there seemed to appear a conclusive answer, in the experience of several Eastern plants. And that answer is a decided "yes".

It has come about through a new approach to the supervisor—a type of work with him that will enable him to deal so with his men that careful, intelligent, interested performance becomes second nature.

The big news in the movement is that it has been made a national one, available to every plant in the country which may be interested.

Much credit should go to two leaders of the chemical industry who, among others, have had the vision to see the need of a new approach, and to work patiently in its development. These men are James W. Irwin, Assistant to the President, Monsanto Chemical Company, St. Louis; and F. C. Evans, Director Service Department, E. I. du Pont deNemours Co., Wilmington, Del. These men are the representatives of the chemical industry on a special industry-wide committee, appointed to direct the new plan of supervisory training.

The program, being made available to the entire chemical industry, had its inception, two years ago. Then it was that certain chemical men started to think through this question of tight operation: how to avoid those terrific wastes of material that seemed to occur out of the blue, or those discouraging accidents that occurred because of somebody's temporary negligence.

Like the Roman roads, these unfortunate occurrences were all traced back to head up at one point—that seemed to be a breakdown of the channel of communication between Management and Men, which prevented sound policy from getting through to the last man.

Even the plant which had been persistent in the use of specific, written outlines of policy and explicit bulletins,—even the plants which had featured discussion groups, and had insisted upon thorough training suffered. Apparently, it was not failure in policy, itself; but failure in stimulating men's wills and intelligences.

The situation was thought through. How shall we make standard procedure so graphic, so realistic that men will not miss it, or fail to follow it, even under conditions of great stress? It was logical to take a leaf from the experience of the moving pictures, and, more specifically, the experience of commercial adaptations of these to sales presentation and sales training. So it was planned to endeavor to reproduce in picture-sequence form the type of occurrences that seemed to be causing difficulties, in such a way as to clearly demonstrate the principles of wrong and of right action.

The Committee decided upon the sound-slide film as combining the dramatic realism of human experience with the teaching technique of emphasis upon certain key-actions. It was pretty much a pioneer effort in the field of human relations in the shop; and it took approximately a year for the satisfactory formula to become expressed in actual productions.

### Six Productions Available

Now a series of six productions is available, as a starter in what is hoped will be a continuous stream of films on subjects of common interest in the problems of Industry.

The manner in which industrial situations have been realistically portrayed can be portrayed only by a view of the sequence of "shots" and scenes in the actual film, itself. The illustrations which accompany this article are merely isolated shots which give the tone and color and something of the feel of the show as a whole. So far as possible, men of the plants were used as models for the moving scenes; superintendents, supervisors, workers, managers, industrial relations men They enacted, in many cases, the types of problems with men which they had experienced, and which had led to difficulties.

The subjects of the first six productions are as follows:

1. *The Supervisor as Manager*

How he handles, or mishandles, the double-task of the growing management detail, on the one hand; and the growing need for effective shop supervision.

2. *The Supervisor as Leader*

Cases from the shop which illustrate the wrong and right ways, and the consequences, have been gathered from Industry as a whole, and reenacted, in this story of Leadership.

3. *The Supervisor as Trainer*

Supervisor Steve finds himself in hot-water because he hasn't learned how to get under the skins of his men, and reach the real man who is there. We see him, struggling with the problem, then finding the way, step by step. He comes to permanent accomplishment.

4. *Letting Men Know Where They Stand*

Our supervisor is baffled on how to get correction over to his men, without causing offense or misunderstanding. We see him develop the formula; then we go through the experience of men who have found the way to the periodic, effective rating of men.

5. *The Reprimand*

Harry Lake, superintendent, suggests to a discouraged supervisor that the men deserve as careful study, as do his instruments. We see the visits to other supervisors, and comparisons of methods, from which a note-book outline of the steps in the sound reprimand is prepared. When this is put to use, immediately is shown a result in the change-about attitude of a worker who welcomed a transfer, previously distasteful.

6. *The Grievance*

Blamed unfairly, as he thought, this supervisor found the path to listening, considering and acting in time to avoid grievances from becoming major plant problems, as often they do.

There are varied uses of these films. They are adaptable to practically every plant situation.

It is true that plants which have been holding supervisory conferences for some time may have covered these subjects. However, the topics are those which require frequent discussion, in order to keep the thinking and action along sound lines. Hence, although the topics may have been discussed, introduction of the Film should aid in improved discussion.

The Film does this in three ways:

First, it makes vivid those situations in which supervisors are most apt to fail to measure up to what the company expects of them. Thus, it stimulates more thorough discussion by the men, and the fixation, in daily action, of improved methods. Thus, constructive discussion is automatically stimulated.

Secondly, the Film makes it easier for the Leader to bear down upon any points which the Management has in mind as a step in improvement. He can use the situation pictured, as an approach to what,

**Above scene shows department heads in conference with shop superintendent on time allocation. The schedule below shows the plan worked out so that the proper amount of time each day will be allotted each supervisory task, with no lost motions.**

TIME-TABLE

| | |
|---|---|
| 8:00-8:30 | - Check Reports<br>Clear New Orders<br>Phone Foremen |
| 8:30-9:45 | - Shop Tour |
| 9:45-10:15 | |
| 10:15-10:45 | - Staff Meeting |
| 10:45-11:30 | - Check New Time Studies & Motion Studies |
| 11:30-12:00 | |
| 12:00-1:00 | - Lunch |
| 1:00-1:45 | - Phoning<br>Shop Problems |
| 1:45-2:30 | - Study New Layouts - Safety and Housekeeping Check |
| 2:30-2:45 | |
| 2:45-3:15 | - Cost Analysis |
| 3:15-3:30 | |
| 3:30-4:30 | - Engineering |
| 4:30-5:00 | - Tomorrow's Production |

otherwise, might seem like scolding or over-emphasis.

Thirdly, each Film gives the start toward the building up of points which are involved in the topic, thus directing the discussion to an organized list of supervisory responsibilities.

For a program which has been in operation some time, the films should restore interest, and add variety. As one executive put it, "We need to present material in a new way, if we are to hold the interest of our men."

One of these films can be used to start off the meeting, or it can be shown midway in a program. Only fifteen minutes are required for a showing. It is recommended that only one film be used at a meeting, since there are sufficient ideas and challenges in each showing, to occupy the mind for a considerable period.

Even if it is not practicable to have an organized discussion of the film at a monthly meeting, it will be found that those who see the film will be inclined to talk it out among themselves. Thus, some discussion value will accrue.

One of the difficulties of the average leader is to get at problems which men are reluctant to express openly, or which they fail to identify.

By careful advanced planning, the experienced leader can use certain incidents in the films, to throw a challenge at the group as a whole, or at certain individual members of the group, which he wishes to draw out. He can open up almost any topic he desires, either because it directly concerns something in the film, or is in contrast with it.

For those who now desire to set up a conference program for the first time, these films furnish a good start on the program, enabling a leader to break the ice, and get discussion going. The Films may prove to be just the missing element, needed for a successful meeting.

To make the films effective, there are provided with each a discussion guide. This sets up the objectives for the meet-

ing or meetings, then proceeds to outline the specific steps which the leader should take to get the group interested in vital points, and draw them out. The guide supplies the questions which are stimulating.

"What do managers report as to the results?" This is a natural question for you to ask.

There are several results.

Trials show that in cases where men have lost interest, the films revive that interest. As one executive puts it, "Our men seem to get fed up on our voices. They begin to think that we are hammering them too hard. The film comes as a fresh, inspiring voice, from a new angle."

A second manager makes this interesting observation: "When we have occassion to correct men for faults which are occurring, they are apt to feel sorry for themselves; get to thinking that they are being singled out for correction, and have about the toughest jobs in the country. The films come along with just as direct a corrective note as we have tried to get across; but it comes to them as something which is being used in industry generally. They do not think of themselves as being singled out. They realize the community of interest in these same difficulties; and take the correction much more gracefully."

### Points Made Thoroughly

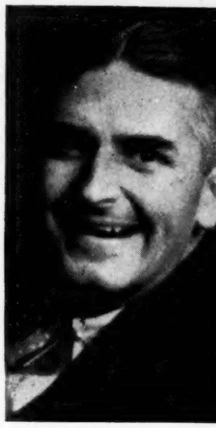
How thoroughly the films put across their points is indicated by the testimony of a third manager. It was two months after the film on the reprimand had been shown to a group of his men. He was hot about a mistake, and started to reprimand one of his men who, apparently, was in error. He hadn't gone far when this man broke in with "Mr. ——, do you remember that film we saw—how it advised us to Be Sure of Our Facts, also to Get the Other Man's Side of the Story." The effect was to make this manager realize that he, himself, was violating the principles. The tension eased, and very great progress was made in increasing the harmony and cooperation in that plant.

That there is a distinct need for such advanced material was indicated by a national survey among manufacturers which showed a great majority who were in favor of having these films developed. That this interest was deep-seated was shown by the fact of cooperation in the furnishing of case-examples. The wealth of this material enabled the producers to weave very realistic stories on human problems and situations. This has proven effective. Almost universally, after supervisors have seen these films they have said "Why, that's *my* problem!" When this step in training can be reached, the penetration becomes comparatively easy.

Especially notable about the films is their comparison of ineffective and effective actions. A deadly parallel is drawn.

# Shipping and Container FORUM

*By* RW Lahey



## A STATEMENT OF POLICY FOR THE COMING YEAR

THE Container Forum and Packaging Section of CHEMICAL INDUSTRIES is designed to give our readers as much of the current, pertinent news and information as comes to our attention. A major effort will be made to report the changes in the Regulations for Transportation of Dangerous Articles by rail, by truck and by water, as well as any other information that may be of value to shippers of dangerous articles.

Based on the premise that the responsibility for packaging and containers is usually placed on the overloaded shoulders of the factory manager, it is hoped that certain data presented in this section will prove helpful. Container packing and shipping costs vary from 2 to over 25 per cent of the total cost, thereby making this item a very probable important consideration. On the other hand the factory manager has many major responsibilities such as quality and volume of production, personnel, etc., which cannot be neglected. He is apt to find himself attempting to solve these container and packing problems in between his more important duties. There being no central collecting agency which is unbiased where he can go to solve his problems, he must depend on advertising and the calls of local salesmen for his information.

By describing equipment and machinery used in packing, warehousing and shipping and by printing announcements of new and proved containers, it is hoped that this section, in a small way, will help in the solving of at least a few container and packing problems.

It must be understood that we are not in a position to recommend all of the containers and machines which are described as there are many types and kinds with which we cannot be familiar. Only good reputable manufacturers products will be included, however.

This is our principal aim for the coming year and any suggestions which our readers may care to offer us will be gratefully received and carefully considered.

### Proposed Marine Rules For Dangerous Shipments

The Bureau of Marine Inspection and Navigation of the United States Department of Commerce has issued "Proposed Regulations governing the Transportation—Storage—Stowage of Explosives or Other Dangerous Articles on Board Vessels," in order that all concerned may have an opportunity to study these provisions prior to the public hearing.

The hearing will be held on December 9, 10, 11, 12, 13, and 14, 1940 in the Department of Commerce Auditorium at Washington, D. C. Sessions will convene at 10 A. M. The first four days of the hearing, from the 9th to the 12th inclusive, will consist of an informal procedure without record. The formal hearing will open on Friday, December 13, and if necessary continue through Saturday, the 14th, to completion. It is felt this dividing the hearing into informal and formal procedure will expedite the resolving of any differences that may be presented for consideration.

#### "Combustible Liquids"

The November issue contained a short notice concerning the content of these proposed Regulations. The new classification termed "Combustible Liquids" regulates the shipment by water of all liquids flashing between 80° F. and 150° F. when transported in passenger vessels but the regulations do not apply for movement in cargo vessels.

It is proposed to regulate still another classification of materials to be known as hazardous articles and defined as follows:

> "Any article or substance other than an explosive, inflammable liquid, inflammable solid, oxidizing material, corrosive liquid, compressed gas, poisonous article, or combustible liquid which is liable when subjected to test for three continuous hours in a Mackey apparatus at or below a temperature of 212° F. to spontaneous heating in excess of 10° F. or which at or below a temperature of 300° F. may liberate vapor susceptible to ignition by spark or open flame, or which in any other way will materially augment the rapidity and violence of fire."

These Proposed Regulations cover common carrier and other than common carrier vessels. They also cover any of these materials transported on highway vehicles on ferry vessels and any of these materials transported in railroad vehicles on railroad car ferries.


Typical wholesalers' meeting held on "Zerex."

# THE WHOLESALER

## As a Merchandising Factor

**By Charles Cunneen, *Assistant Editor***

**The Wholesaler and His Sales Force Hold a Key Position in Any Well-Rounded Merchandising Program. This Is Doubly True When a New Product Is Being Launched in National Distribution. How the du Pont Company Wins This All-Important Support Makes an Article Worth Reading and Saving.**

AN all-important—though often overlooked—factor in launching a new product is wholesaler co-operation. When the initial merchandising program is begun, consumers usually are well promoted through various consumer advertising mediums; retailers are notified of the launching drive through the retail trade press, but in many cases the wholesaler is merely sent a promotion piece which urges him to stock up in anticipation of the demand from retailers he serves.

In striking contrast to this neglect of the wholesaler, is the campaign which the Zerone Division of E. I. du Pont de Nemours & Co., conducted to win wholesaler support for its newly introduced high-boiling anti-freeze "Zerone-Zerex."

Of course, the selling of anti-freeze presents a problem peculiar to this type of merchandise. It is highly seasonal, and everything must be done in a few short weeks of the peak period. However, what was done in this case might be adapted in a more leisurely manner where sectional markets are opened in rotation.

The problems involved in successfully launching a new product are many, but they can all be boiled down to a formula containing four factors, namely a public, a product, a process, and a profit. In order to bring about the last mentioned and vital factor, it is necessary to put into effect a marketing plan that will effectively bring the product to the public.

The job in the sales end might be described as involving two factors, the distribution of the selling job, and the distribution of the product. This discussion will be confined to a brief outline of the ideas regarding selling or the distribution of the selling job. If any success is achieved with that end, the distribution of the product will pretty well take care of itself—or at least it will follow logically and effectively.

The plan followed with "Zerex" was very similar to that used with "Zerone," another Du Pont anti-freeze introduced several years ago, and follows the more or less standard practice in the automotive after-market of selling the products through distributors or jobbers or perhaps, to use a more general term, wholesalers.

In selling of this kind, it might be well to emphasize that the effort and cooperation of the wholesaler is all-important. In fact, the phrase, "distribution of the selling job" simply means enlisting the cooperative effort of those wholesalers or distributors.

In presenting the "Zerex" proposition to a wholesaler, the sales organization felt it best to present him with a fair, logical picture of the possibilities in the anti-freeze business and interest him in the idea of "going into the anti-freeze business with us."

The distinction between a wholesaler's "going into the anti-freeze business with us" as compared with his purchasing a stock of goods is, according to the du Pont Company, a vitally important distinction. In becoming a partner, so to speak, he is undertaking to discharge certain responsibilities and functions which can be outlined briefly as follows:

He takes merchandise in wholesale quantities and sells it in retail quantities.

And it is emphasized that *he* sells it, which means in turn that he must organize his sales force and his selling activities to do a mutually satisfactory volume of business.

The company can and does supply him with all the information and data that he can possibly use in intelligently planning his selling activity. The primary responsibility, however, of selling the merchandise is his. The company's sales force supplies him with sales guidance and sales help in terms of a close check on the activities of this sales force and the results they are obtaining.

### Education Essential

A very important part of this distribution of the selling job is educating the wholesaler's salesmen in the essential facts of the products and seeing that these products are given proper attention among other lines carried by the same wholesaler.

The most practicable way to convey a story to a wholesaler and his staff is through the medium of the sales meeting. It is well known that sales meetings are many times called with wild abandon, and too often with insufficient regard for the time and effort of the wholesaler and his organization. It should here be noted that while the company might emphasize the responsibilities that the wholesaler assumes, it should not take lightly its own responsibilities to the wholesaler.

When the sales representatives ask for a sales meeting with a wholesaler's organization they should offer a plan which forecasts exactly how much time will be needed and a presentation so planned that it will effectively and entertainingly present the company's story.

### Took Page From Radio

In this connection the "Zerex" sales organization took a page from radio. It is well known how popular the radio has made quiz programs, or question-and-answer programs, of all sorts and descriptions. In planning the sales meetings for the season this technique, which the radio had proven so popular, was freely employed. The essential features of the product story and the sales story were encompassed in a series of questions. To conserve time and get the job done early enough in the season to permit effective use of the information, group meetings were held. At these group meetings several wholesalers and their organizations were gathered together in one evening.

The company engaged Professor Quiz, who originally started the quiz programs on the air, and his announcer, Bob Trout, to appear in a motion picture presentation of the "Zerex" story based on Professor Quiz's technique. The showing of the picture is followed by a quiz program conducted by a sales representative who has been specially trained for such a job. A small monetary reward is made for correct answers while for incorrect answers the award is put into a pot or kitty which is drawn for by the audience after the meeting is over.


**Another scene at a wholesalers' meeting on Du Pont anti-freezes. At right is radio's popular Dr. Quiz, whose technique is borrowed to add interest to the meetings. A commercial movie in which Dr. Quiz is featured has been made on these products.**

Typical of the questions asked at these quiz sessions are the following:

*Why is a cooling system a necessary part of the automobile?*

*Why is water used in the cooling system?*

*Can you tell me the two principle disadvantages of water as a cooling liquid?*

*What is an anti-freeze?*

*From what is "Zerex" made—is it made from dihydroxethane? Difluorodichloromethane? Paradichlorobenzene? Hydromethane?*

While this is but a partial list of questions, it can readily be seen how education of the sales groups on the product is effected in an entertaining manner. The company representative, of course, elaborates on the answer, adding to the salient points necessary for the salesman to do the best possible job.

For each question the "Zerex" sales representative is provided with certain introductory remarks that help to personalize the meeting as a whole and focus attention on the question to be asked. The question itself is then framed and the correct response to that question makes a sales point, or at least enough of a point so that the "professor," or sales representative, can logically enlarge on the answer and thereby make the sales point. The questions and answers are arranged in logical sequence so that when completed the entire story has been told.

The "Zerex" sales force has found a gratifying reaction to this technique. By planning the meetings well ahead and providing a means for keeping selling organizations well informed of the date an excellent attendance has been secured. In every case those attending have voluntarily made expressions of their interest in the type of meeting and given every assurance that they "have really gotten something" out of the session.

**CHEMICAL SPECIALTY NEWS**

**Specialty news, including a report on the New York convention of the N. A. I. D. M. convention will be found in the main news section, starting on page 697.**

# New Chemicals For Industry

**By James M. Crowe, *Assistant Editor***

THE recent announcement of the development by Commercial Solvents Corp. of a process for the biochemical synthesis (U. S. Patent 2,202,-161) or riboflavin (Vitamin $B_2$ or G) marks an important advance in vitamin technology. This development places riboflavin in a new economic range which makes its use in pharmaceutical and food products more practical and economical. Commercial Solvents' new product, which is sold under the trade-name Solvamin, is a high-potency source of riboflavin, containing over 4500 micrograms of riboflavin per gram. In addition to being a rich source of riboflavin, Solvamin contains appreciable amounts of other members of the vitamin B complex, particularly pantothenic acid, also called "the acid of life" since it has so far been found to be essential for all forms of life—animal, plants and bacteria.

Since the discovery of riboflavin only a few years ago, the place of this vitamin in both human and animal nutrition has assumed rapidly increasing importance. It has been recognized for some time that high levels of riboflavin are essential in poultry feeds and more recently data have been presented which indicate that this vitamin is just as essential in human nutrition.

The use of riboflavin in clinical cases and by general practitioners is widespread today and new applications for riboflavin in the treatment of deficiency diseases are constantly being studied. While the study of the role of riboflavin in human nutrition, is far from complete there is an increasing weight of evidence pointing to the importance of this vitamin in the treatment of deficiency diseases.

Solvamin is already being used by the pharmaceutical and food industries as a source of this important vitamin, riboflavin. Some of the large manufacturers are supplying it in flour and cereals.

### Substitute for Toluol

Now that the demand for toluol has been greatly accelerated ,it is possible that some needs may be satisfactorily filled by use of some other products.

In this direction, the Neville Company is now offering a new replacer, called Notol, for industrial pure toluol. It is slower evaporating and milder odored than toluol, water white, and has an approximate nitrocellulose dilution ratio of 3.1 at 7.8% as compared with the dilution rate of toluol of 2.93 at 8.1%. A characteristic Notol test runs as follows: Specific Gravity at 15.6/15.6° C.—.800. Initial boiling point—72° C. 10% off—86° C. 50% off—112° C. 95% off—140° C. Dry point—142° C. Copper corrosion test—negative. Saybolt color—(+30).

### Lignin

In a recent address Dr. Elwin E. Harris of the Forest Products Laboratory, Madison, Wis., told how chemists can now add a plasticizer to wood that will so soften the lignin, which with cellulose constitutes the essential part of woody tissue, that when it is hot the wood may be bent or twisted into various shapes. Dr. Harris explained that phenol and formaldehyde both react with lignin, causing it to soften. If wood is treated with such a mixture in a water solution, these chemicals enter completely into the structure of the wood, and if heated and pressed, a new wood composite is obtained in which a lignin-phenol-formaldehyde plastic holds the cellulosic fibers more tightly together than in the original wood. Dr. Harris also pointed out the enormous waste of lignin which next to cellulose is the most abundant organic material produced annually by nature.

More than one hundred years have passed since lignin was first recognized as a constituent of plant material, but it is not yet understood because it does not readily split up into identifiable building units, as is the case with its associate, cellulose. It is not possible to give a chemical definition for lignin. Dr. Harris says the best definition we have is that "lignin is a carbohydrate material remaining after plant substances have been freed from tannins, pectins, waxes, fats, proteins and other similar compounds." Work is being done toward a complete understanding of the structure and nature of lignin and with the solution of these, many channels might be opened for the use of this abundant material.

### Emulsifier

Fluid emulsions containing sodium chloride, oxyquinoline sulfate, acetic acid, hydrochloric acid and other electrolytes can now be made with EMULGOR A, a new emulsifying agent, manufactured by the GLYCO PRODUCTS CO., INC. Stable emulsions of mineral oil, pine oil, toluol and other oils, waxes and solvents containing as high as 6% concentrated hydrochloric acid and other strong electrolytes have been made with this emulsifying agent. The new product is a light-tan colored, wax-like material with a melting point of 44-53° C. and a specific gravity of 1.04 to 1.06 (25° C.). It is dispersible in hot water, a 5% dispersion having a pH of 2.6 to 2.8 to 25° C. It can be used for cosmetics, textiles, paper, leather, and other purposes where an emulsion is required containing salts, acids and other electrolytes.

### Lubricant Additive

A new additive for crank case oils that is unique in its multifunctional characteristics was announced recently by J. R. Mares, head of the Petroleum Chemicals department of Monsanto Chemical Company.

An oil soluble salt of phenolic acid, the new product has properties which allow it to function effectively in a variety of capacities. It is said to impart detergency to the oil, have a favorable effect on the viscosity index, inhibit oxidation of the oil and consequent ring sticking, prevent corrosion of copper-lead and cadmium-silver type bearings, and eliminate the necessity of incorporating a separate pour-point depressant. It will be offered to the trade under the name Santolube 261.

### $Ag_2O$ as Oxidizing Agent

The possibility of using silver oxide as an industrial oxidizing agent is raised by an investigation carried out by Dino (*Ann. Chim. Appl.* 1939, *29*, 10, 448-451). Silver oxide freshly precipitated from silver nitrate solutions with alkali is the best known laboratory agent for the conversion of aldehydes to the corresponding acids, the oxide being quantitatively reduced to silver at the same time. The cost of silver renders the commercial use of its oxide in the quantities necessary impracticable, owing to the inevitable losses that would occur in handling such large quantities. It has been found, however, that a mixture of silver and cupric oxides, obtained by adding caustic soda to a solution of copper sulfate containing an amount of silver nitrate equal to 1 per cent. of the weight of copper sulfate present, is practically as effective as the equivalent amount of pure silver oxide. In experiments (laboratory scale) furfural was oxidized to pyromucic acid in 2 hours with a yield of 91-93 per cent., and benzaldehyde converted to benzoic acid with a recovery of 92.6 per cent. Cupric oxide alone is very inefficient. The action of the silver oxide may be regarded as catalytic, the following reactions occurring:—

$$Ag_2O + R.CHO + NaOH \rightarrow 2\ Ag + R.COONa + H_2O$$

$$2\ Ag + CuO \rightarrow Ag_2O + Cu_2O$$

The CuO is thus considered not to take any part in the actual oxidation, but to serve as a means of perpetually regenerating the more efficient $Ag_2O$. *The Chemical Age*, Feb. 10, 1940.


***. . . . when this organization got its start***

It's a long way back to the year 1816, when this business began with the operation of a small dyewood mill seventy-five miles from New York City. A lot of history has been made since then, and today, with our country beset on every hand with problems, we are proud to be in the front rank of those supplying the needs of American industry.

When you need Industrial Chemicals, Gums or Waxes, remember that ISCO is a brand name that you can trust . . . and that it is backed with nation-wide branches and representatives able and eager to serve you.

ISCO CHLORIDE OF LIME (Bleaching Powder)
33-35% available Chlorine

ISCO CAUSTIC POTASH—Liquid
Sparkling clear, water-white solution
Ironfree, if required, 45 and 50% strength

ISCO CARBONATE OF POTASH
Hydrated 83-85%
Calcined 98-100%

ISCO CAUSTIC POTASH 88-92%
Solid • Flake • Broken
Granular • Powdered • Walnut

ISCO FERRIC CHLORIDE—Crystals
Grades for every industrial purpose

ISCO GUM ARABIC
Sorts • Grain • Powder
Granules • Crushed

ISCO GUM KARAYA
Whole • Powder • Crystal

ISCO LOCUST BEAN GUM
Powder • Fine • Coarse

ISCO CERESINE WAX
Prime quality • Uniform

ISCO Refined CARNAUBA AND CANDELILLA WAXES
Lumps and Flake

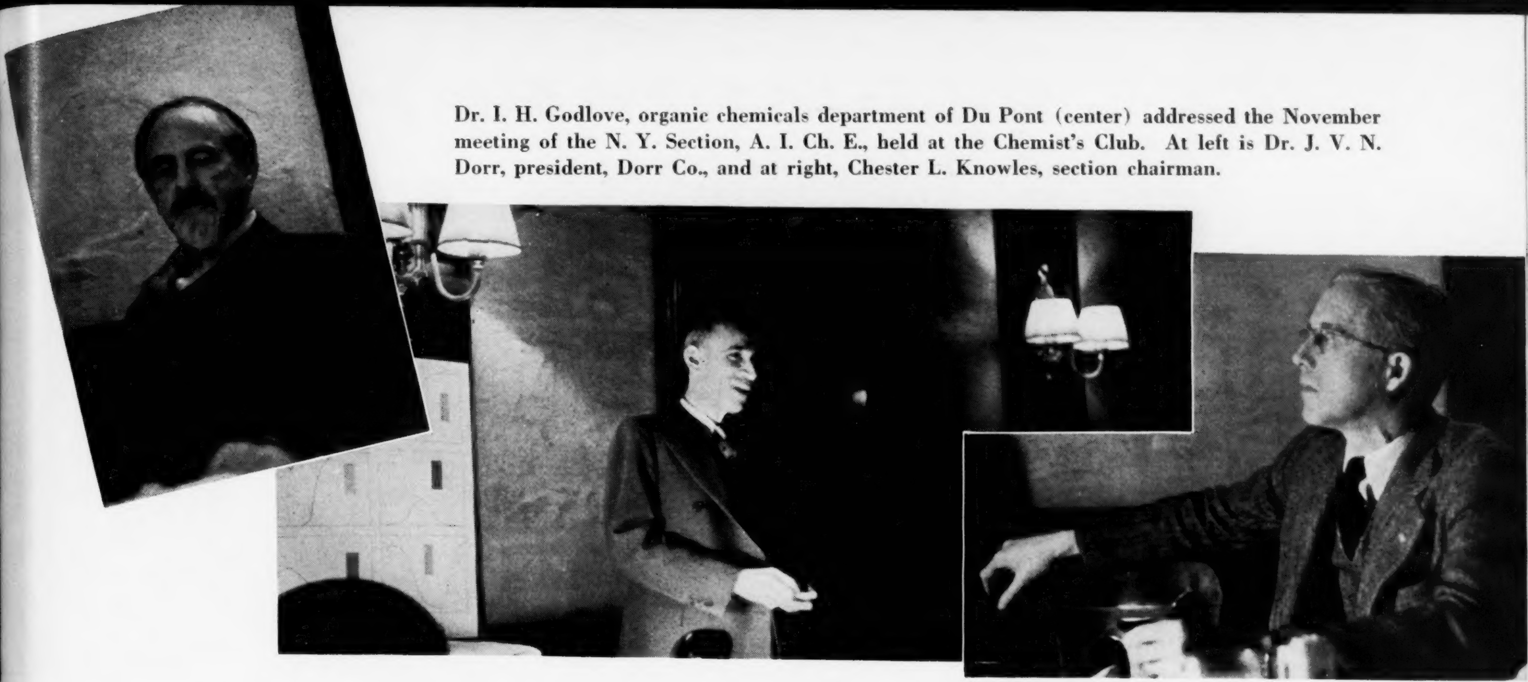
# INNIS, SPEIDEN & COMPANY

*Established 1816*

**117-119 Liberty Street • NEW YORK**

**BRANCHES: CHICAGO • CLEVELAND • PHILADELPHIA • BOSTON • GLOVERSVILLE**

**FACTORIES at Niagara Falls, N. Y., and Jersey City, N. J.**



Dr. I. H. Godlove, organic chemicals department of Du Pont (center) addressed the November meeting of the N. Y. Section, A. I. Ch. E., held at the Chemist's Club. At left is Dr. J. V. N. Dorr, president, Dorr Co., and at right, Chester L. Knowles, section chairman.

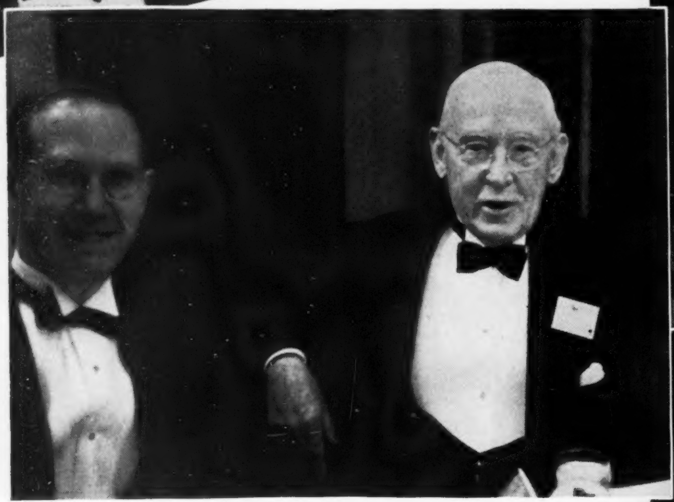
★ ★ ★

New members of the N. Y. City Chemists' Club were introduced to each other and to older members at a recent meeting. After dinner they were escorted through the club, while group leaders explained facilities and activities. At left, is Howard Bishof, chairman of the new members committee, with a group of new members. In center, Dr. Edward R. Allen, technical director, Krebs Pigment division of Du Pont, and at right, Robert Moore, director of development for Bakelite.

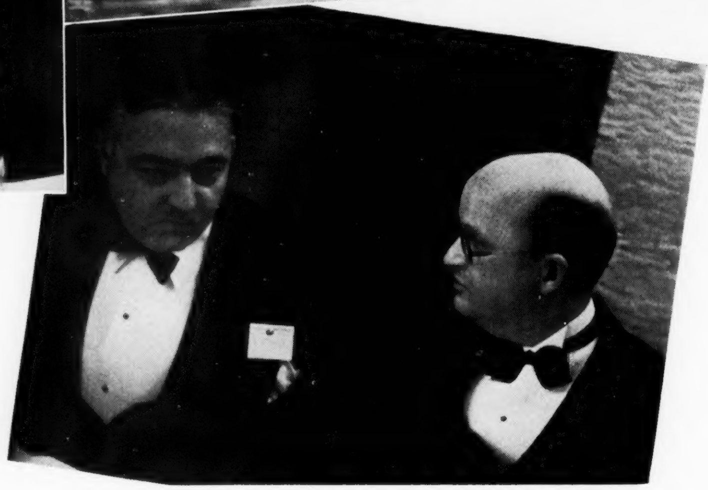
General Dyestuff Corporation is now occupying its new office, laboratory, and warehouse building on Wilkinson Blvd., Charlotte, N. C. It is fully equipped with the most modern dyestuff and research equipment. B. Anderson-Stigen is Charlotte manager.

## *S.C.I. and A.I.Ch.E. Hear About Plastics*

C. W. Blount (left), assistant salesmanager, Bakelite, discussed science and application of plastics before joint meeting of groups held at N. Y. City Chemists' Club. At right are Prof. H. Marks, Brooklyn Poly, and J. W. H. Randall, consulting chemist.



A. J. Weith of Bakelite (left) and D. D. Jackson, former head of Columbia's chemical engineering department, relax as the speakers get underway.



Foster D. Snell, of Foster D. Snell, Inc., and Theodore F. Bradley of Cyanamid's Stamford Laboratories, consider a point.

Something new in the way of a bowling league has just been launched by the NOPCO A. A. of National Oil Products Co., Harrison, N. J. Six of the officers got together and decided to sponsor an Intra-Company Bowling League—each officer picking his own team from among company employees. Here are the captains of the various teams, lined up just before starting the season with their respective backers ready to cheer them on. From left to right are: Joseph Nothum, representing Treasurer Ralph Wechsler; Charles Augustine, representing Vice President G. D. Davis, Gus Beck, captain of Vice President T. A. Printon's team; Al Lelong, representing Vice President Perc Brown; William Tango, representing Secretary A. A. Vetter, and Michael Tango, captain of President Charles P. Gulick's entry.

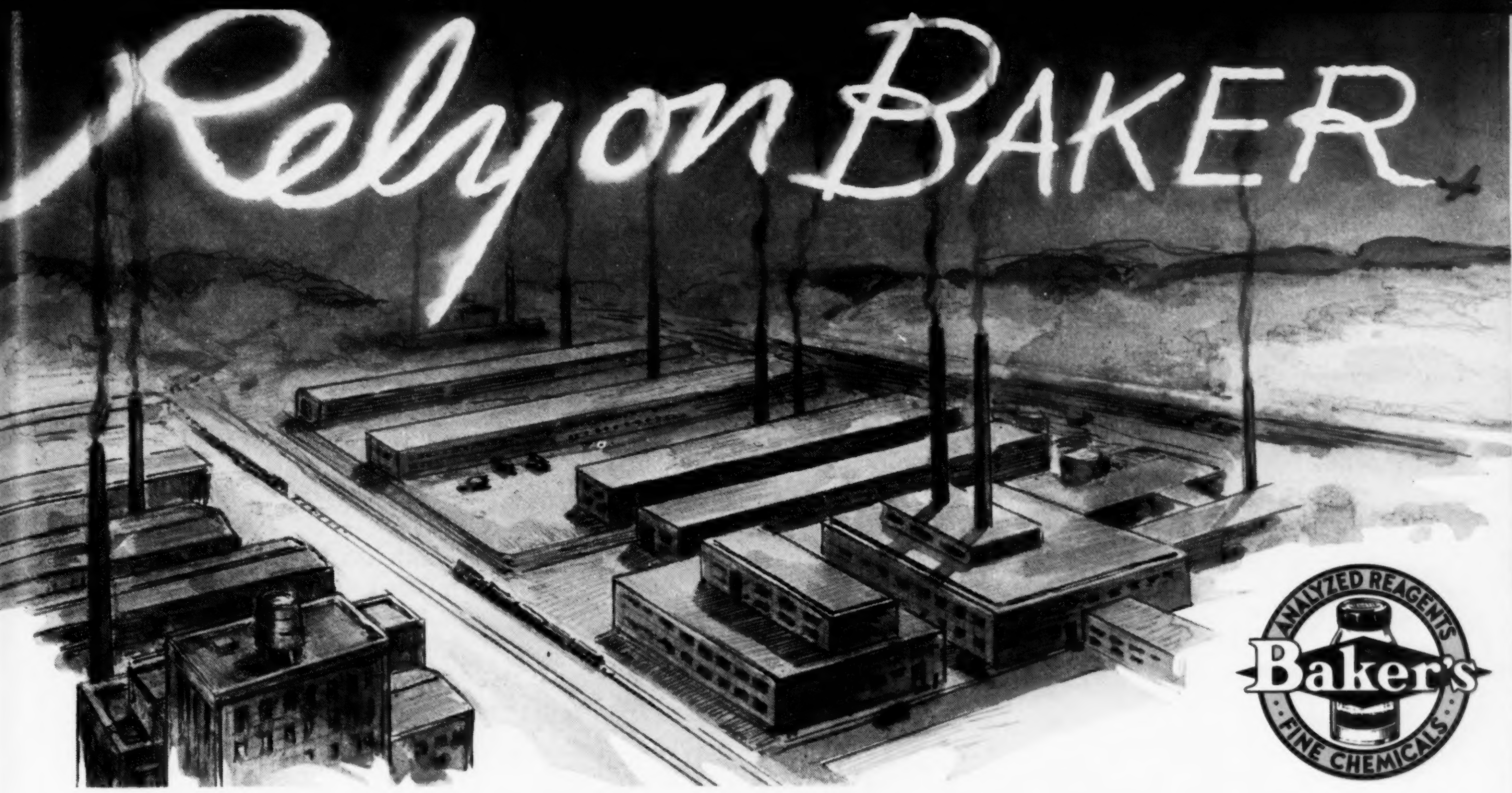
# *Dow's New N.Y. Offices*

Dr. Ralph E. Dorland, Dow's New York manager seems at home already at the desk in his brand new office. There is no change in the address; in fact the new quarters are even on the same floor.

Fred Koch (above) was caught by the camera at his desk when the new quarters were officially opened. At right is spacious reception room at new quarters.

Two Nobel prize winners in chemistry graced the rostrum at the recent meeting of the N. Y. Section, A. C. S., held at Hotel Pennsylvania. At left is Dr. Harold C. Urey, head, Columbia's department of chemistry, and (below), Dr. Peter DeBye, who holds the same position at Cornell.


Du Pont's Lucite, is the medium chosen by Robert B. Karoff for this novelty perfume package. The figurine is of Lucite, while the brass globular shell she is holding contains an Owens-Illinois bottle filled with perfume.




# For Tonnage Chemicals to Specification

If you need tonnage chemicals to special specification, look to Baker. We are particularly well equipped to manufacture chemicals which are used as raw materials in production, to the exacting specification required by the buyer. We have done this very thing for many industrial buyers with the result that their costs have been lowered and the quality of the finished product improved.

It is not unusual for a manufacturer to submit his entire problem to us. In cases of this kind we willingly contribute the combined knowledge of our Technical, Executive, and Manufacturing Staffs to the end that the customer's special requirements may be met.

Many of these special formula chemicals are manufactured under code number. In such cases, the names of these chemicals never appear on our records. We do this as a protection to our customer.

If you have special chemical requirements on standard or special specifications, we invite you to discuss in confidence your needs with a Baker representative. Or, if you prefer, arrangements may be made for a conference with a Baker executive either at your plant or at our offices at Phillipsburg.

You can rely on J. T. Baker Chemical Co. for industrial chemicals of a definite specification.

J. T. BAKER CHEMICAL CO., Phillipsburg, New Jersey

| | | |
|---|---|---|
| NEW YORK<br>420 Lexington Avenue | PHILADELPHIA<br>220 South 16th Street | CHICAGO<br>435 North Michigan Avenue |

# Baker's INDUSTRIAL CHEMICALS

## Quick Facts about

# MALLINCKRODT NUTGALL PRODUCTS

**This chart tells you at a glance why Mallinckrodt Tannin Products appeal to so many intelligent buyers. See for yourself the essential points about each grade. Isn't the grade you need there?**

## NUTGALL PRODUCTS

**ACID GALLIC**

| Average characteristics | N.F. VI | Technical |
|---|---|---|
| Appearance | Yellowish gray flaky powder | Light gray-brown powder |
| *Mesh | 95% passes #120 sieve | 100% passes #100 sieve |
| Bulk | 35 fl. oz./lb. | 30 fl. oz./lb. |
| Assay (% anhydrous acid) | 92% | 89% |

**ACID TANNIC**

| Average characteristics | U.S.P. XI Fluffy | U.S.P. XI Powdered | Technical |
|---|---|---|---|
| Appearance | Pale yellow fluffy powder | Light yellow powder | Brownish yellow powder |
| *Mesh | 100% passes #100 sieve | 100% passes #180 sieve | #100 sieve 100% passes |
| Bulk | 195 fl. oz./lb. | 25 fl. oz./lb. | 25 fl. oz./lb. |

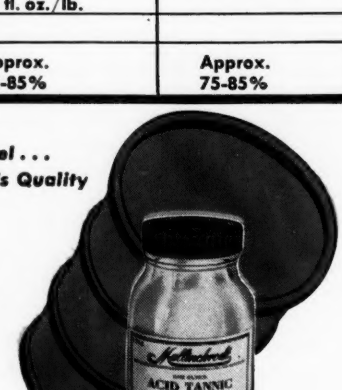
**ACID PYROGALLIC**

| Average characteristics | U.S.P. XI Resub. Medicinal | Cryst. Photo | Tech. Powder | Tech. Lumps |
|---|---|---|---|---|
| Appearance | White fluffy crystalline powd. | Small irregular white crystals | Dark gray-brown powder | Gray-black lumps |
| *Mesh | 90% passes #100 sieve | Approx. 6-16 mesh | 100% passes #100 sieve | Irregular lumps ½-1" diameter |
| Average bulk | 65 fl. oz./lb. | 30 fl. oz./lb. | 38 fl. oz./lb. | |
| Melting point | 131-133°C | 130-132°C | | |
| Average assay by sublimation | | | Approx. 75-85% | Approx. 75-85% |

*All sieve sizes U. S. Standard.

**Prices and Literature on these and other Nutgall products can be obtained by writing to Mallinckrodt either at St. Louis or New York.**

***Bottle or Barrel . . . Mallinckrodt Spells Quality***




# MALLINCKRODT CHEMICAL WORKS

**2nd & Mallinckrodt Sts., St. Louis, Mo. • 70-74 Gold St., New York, N. Y.**

**CHICAGO PHILADELPHIA MONTREAL TORONTO**

# NEWS OF THE MONTH

## GOVERNMENT

### *Nitrate Indictments*

A vigorous fight to give the lie to price fixing charges on nitrates is forecast by the quick official denials of Allied Chemical & Dye, and Du Pont to the U. S. indictments handed down in N. Y. City federal court last week. Some surprise was expressed by both companies that the indictments sealed in 1939 and based on fertilizer nitrates were withheld until now when a reference in the indictment ties them up to national defense.

One section of the indictment, in the best E. Phillips Oppenheim manner, charges a world-wide conspiracy. It is alleged that restrictive contracts governing production and marketing existed covering the "United States, Norway, England, Switzerland, Germany, Canada, Sweden, Poland, Belgium, Japan and Chile"

The offenses, according to the indictment, are alleged to have been committed from 1930 to 1939.

In the Allied Chemical denial, it is pointed out that this country was wholly dependent upon foreign suppliers for nitrates until the Semet-Solvay plant in Hopewell, Va, went into operation. During the last World War, the U. S. Government paid as high as $150 per ton for nitrate of soda, and average price paid by government agencies for the duration of the war was $82.50 per ton. Current price of the material is $27 per ton.

**Don Cushman**

**Mr. Cushman, Cleveland manager of Innis, Speiden & Co., will direct sales in Ohio and Western Pennsylvania on powdered silicate products of Cowles Detergent Co., under arrangement which went into effect Nov. 1.**

W. S. Carpenter, Jr., Du Pont president, released an answer which reads, in part:

"We have not seen the indictments; therefore, we cannot comment on their content other than to deny any violation of law.

"The reference to munitions impels us to state that this Company has made, is making, and will make every effort to aid in meeting the Nation's needs for defense. In these undertakings, it has always endeavored to keep costs at the minimum, with service to the Nation always the dominant consideration. Any charge, any inference otherwise, is untrue.

"As an evidence of our co-operation with the Government, we have agreed to erect and operate a plant at Morgantown, W. Va, for the Government for the fixation of nitrogen for the production of munitions, and, to that end, have made available to the Government all of our technical information and experience in such manufacture.

"The investigation on which the indictments were based began prior to the outbreak of the present hostilities in Europe. It dealt primarily with nitrates for the fertilizer industry. It was concluded more than a year ago. For some reason, the release of the indictments were delayed until today."

Companies named in the action include Allied Chemical & Dye., The Barrett Co., Semet-Solvay Co., Solvay Process Co., E. I. du Pont de Nemours & Co., Chilean Nitrate Sales Corp., and Synthetic Nitrogen products Corp.

**"Lumitile," tile-like hollow blocks molded of Monsanto Lustron was introduced at a N. Y. City luncheon held by Monsanto Plastics Division, in conjunction with Co-operative Displays, Inc., Cincinnati. The new application is suggested for use in architecture and interior design.**

### *Dies "White Paper"*

In several quarters in the chemical field the recent publication of the "White Paper" of the Dies Committee was taken as confirmation of rumors that were widespread last spring that German-controlled chemical merchandising concerns in South America were offering to take orders for a number of important chemicals and were offering to post cash bonds to guarantee delivery not later than Oct. 1. None of these rumors were actually confirmed at the time, according to generally well informed chemical circles, but the stories were heard in many different places.

Generally it is believed that if American-made merchandise did fall into the hands of German-controlled interests the quantities were very small and of little consequence. American chemical manufacturers, it was pointed out, have gone to great lengths to make certain that their products have gone into legitimate domestic consuming channels and have labored earnestly to prevent speculation in chemicals and run-a-way markets. It was further pointed out that American chemical manufacturers were unable to prevent consumers from reselling at higher prices and possibly some tonnages of this character have found their way into South America, but it is believed that the total has been extremely small.

The "White Paper" was the first of

D. G. Hoyer, John Powell & Co., Inc., was kept busy at the registration desk of convention held by National Associataion of Insecticide & Disinfectant Mfgrs. at Hotel Roosevelt, Dec. 2-4.

what committee members indicated would be a series of revelations as to activities of foreign agents on the American scene.

The investigation revealed, the committee said in its report:

now an American citizen, had jurisdiction over trade arrangements between Germany and the United States and Germany and South America. Deliveries of orders had been made, despite Germany being in a war, by a "damned clever" scheme, the details of which were not disclosed.

A large part of the report was given over to the exhibits concerning Dr. Kertess, although Dr. Kertess is an American citizen and his firm is classified as an American concern. The committee said the "the evidence in the possession of the committee, however, discloses that Dr. Kertess and his firm have been, and are engaged in activities which tend to show that their allegiance to the Nazi government is of prime importance, to the exclusion of any other country."

Following the publication of the Dies Committee "White Paper," severe criticism of the methods of the committee were made by Attorney-General Jackson who claimed that the FBI was being severely handicapped in its work. This was followed by a sharp rebuke by President Roosevelt, sent in a telegram to Chairman Dies. A conference between President Roosevelt and Chairman Dies, held as the month closed, appeared to have settled the respective "spheres" of the FBI and the Committee. As he emerged from the President's office, Mr. Dies stated that the conference had been "satisfactory."

### *Defense Paint*

President Ernest T. Trigg of N. P. V. & L. A rushed essential information regarding he War Department's invitation for bids on what is believed to be the largest single paint order on record, to all members of the Association The paint, which is to be used for painting the new cantonments in the National Defense program, is estimated at a minimum quantity of 827,505 gallons of cream and gray paint with the government reserving the right to increase this quantity by 25%, which would mean a possible maximum of 1,034,000 gallons.

## ASSOCIATIONS

### *N.A.I.D.M. Meeting*

Insecticide and disinfectant manufacturers in unprecedented numbers trekked to N. Y. City's Hotel Roosevelt last week to attend what has been described as the most informative business sessions ever held by the National Association of Insecticide & Disinfectant Manufacturers. Several representatives were present from many companies who heretofore had sent but a single representative, a comparison of registration records revealed.

Highlighting the business session was the talk by Dr. C. C. McDonnell, chief, Insecticide Division, U. S. D. of A., who discussed: "Recent Change in the Organization of the U. S. Department of Agriculture as it may affect the Enforcement of the Insecticide Act of 1910."

Another feature which packed the capacious meeting room was that of C. C. Concannon, chief, Chemical Division, Department of Commerce. Mr. Concannon gave the conventioneers "Latest News on the Markets for Imported Raw Materials."

A discussion on "The effect of the Defense Program on Sanitary Supplies and Insecticides," delivered Tuesday afternoon, was another talk which broke up the "gossip groups" in the foyer.

The business sessions were followed by a cocktail party and informal beefsteak dinner on Tuesday evening.

Following officers were re-elected:

President, W. J. Zick, of Stanco, Inc.; first vice-president, John N. Curlett, of McCormick & Co.; second vice-president, Henry A. Nelson, of the Chemical Supply company; treasurer, John Powell, of John Powell & Co., Inc.; and secretary, Ira P. MacNair, of the McNair-Dorland Company.

**John R. Toohy**

Mr. Toohy, E. R. Squibb, has been named Chairman of the Drug, Chemical & Allied Trades Section, N. Y. Board of Trade, succeeding Dr. Ralph E. Dorland of Dow.

### *A.I.Ch.E. Meeting*

More than 400 chemical engineers attended the New Orleans meeting of the A I. Ch. E. Dec. 2, 3, and 4. A full story on the meeting as well as side trips to plants in that area will be reported by Walter J. Murphy, editor of this magazine, in the January issue.

### *Salesmen's Party*

The Salesmen's Association of the American Chemical Industry will hold its annual Xmas Party at the Edison Hotel, N. Y. City, Dec. 19.

### *S.O.C.M.A. Meeting*

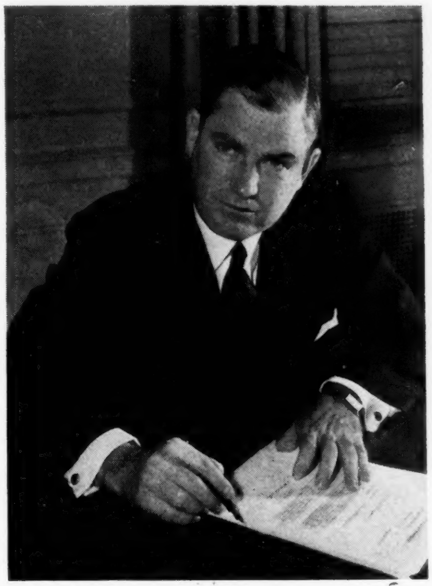
Synthetic Organic Chemical Manufacturers Association holds its annual meeting Dec. 12, at N. Y. City's Chemists' Club.

### *Pest Control Date*

Purdue Pest Control Operators Conference will be held Jan. 6-10 at Lafayette, Ind.

### *Chemical Dinner*

Annual Drug, Chemical and Allied Trades Dinner will be held March 13, at Waldorf-Astoria, N. Y. City.



**R. K. Shirley**

Elected vice-president and treasurer, Freeport Sulphur.

# GENERAL

### *Shell's New Plant*

Plans for the construction of a new-process solvent extraction plant, the first of its kind in the middle west, are being readied by Shell Oil Co. It will be the first plant ever to produce high solvency napthas and odorless cleaning solvents successfully from mid-continent crude oils.

The new plant, to be located at Shell's Wood River refinery, will cost $550,000 and will go into operation early next summer.

Its construction is being carried on entirely separate from the $10,000,000 refinery expansion program announced early this year and now in its final stages at Wood River.

Constantly increasing national defense demands and the kindred expansion of the building industry, one of the largest users of naphthas, are given by B. G. Symon, technical products manager for the Shell Company, as the primary reason behind the erection of the plant.

### *Derby Denies Sabotage*

H. L. Derby, president, American Cyanamid, officially denied any evidence of sabotage in the recent explosions in company plants.

"A most thorough investigation has been made of the explosion at our Bridgeville Plant," said Mr. Derby. "In this investigation we had the full cooperation of Samuel K. McKee, Special Agent in Charge in the Federal Bureau of Investigation and his various assistants, the State Police, and the County Detectives, together with the Corporations technical experts.

"It has been determined by our technical staff that the cause of the accident was the failure of a recently repaired internal part of the converter involved. This failure permitted unusual chemical reaction within the apparatus and resulted in an explosion. We have definitely established that the cause did not arise from any outside source. There was no sabotage. This is the first accident of this character that has occurred at this plant since it was constructed in 1928.

"A thorough investigation has been made of the explosion on Nov. 12 in the dynamite plant of the Corporation at New Castle, Pennsylvania, and, while in that instance most of the evidence which was present in the particular building in which the explosion occurred has been destroyed, the management of the plant and those who assisted in the investigation are convinced that the explosion was the result of an accident and not caused by sabotage."

# PERSONNEL

**R. K. Shirley**, who joined the Freeport Sulphur Co., in 1922, has been elected vice-president and treasurer ... **M. J. Sullivan** has been elected executive vice-president, American Can ... **A. F. Payne** has been named general sales manager, Sherwood Petroleum ... **Howard Smith** has been named manager, varnish-resin sales, Bakelite Corp. ... **Dr. W. D. Coolidge** and **Stuart M. Crocker** have been elected General Electric vice-presidents.

**R. V. Schneider** has been named manager, New Philadelphia sales and service branch of Robinson Mfg. Co. ... **H. R. Interdonati** has been named manager, special products department, S. B. Penick & Co.... **Max Souder** has been appointed superintendent, Armour Fertilizer Works, Carteret, N. J.... **Dr. Dale S. Chamberlin** named sales manager, stearate division, Warwich Chemical ... **Joseph Radov** has joined research staff, Griffith Laboratories, Chicago; **Theodore Fetherstone** takes charge of new laboratory at Griffith Newark plant ... **James R. Simpson** will manage Columbia Alkali sales office at Charlotte, N. C., and not Durham as reported last issue. Mr. Simpson hails from Durham.

**John M. Spangler,** general sales manager, National Carbon Co., has been elected vice-president ... **R. C. Braden** has been named assistant sales manager, Nashville division, Federal Chemical Co.... **E. D. Swainson** has been appointed general superintendent, Newark paint and varnish plant, Vita-Var Corp.... **W. R. Treadway** named acting manager, Virginia-Carolina Chemical Corp., Atlanta branch ... **Selden G. Hait**, Jr., has joined the Philadelphia staff of Kentucky Color & Chemical ... **M. P. Hoffman** has been named manager, research and sales, new Colloid Mill department, C. O. Bartlett & Snow Co.... **Hugh B. Hodge, Jr.,** has joined the technical division, John M. Masury & Son, Brooklyn.

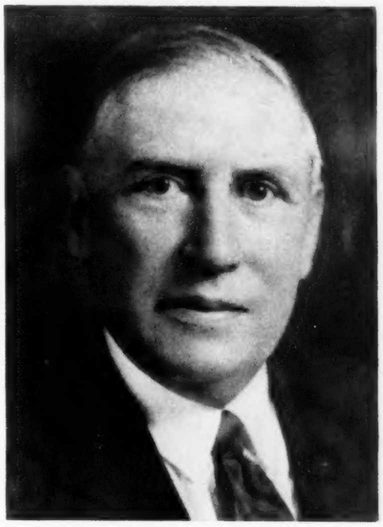
# OBITUARIES

### *Wilbert J. Austin*

Wilbert J. Austin, 64, president, The Austin Company, and foremost advocate of functionalism in factory building, was among the victims of the airliner which crashed at Chicago, Dec. 4. Mr. Austin, one of the earliest patrons of commercial air services, was estimated to have flown more than half a million miles in transport planes.

### *Dr. H. A. Baker*

Dr. H. A. Baker, 59, president, American Can Company, died at New York Hospital Nov. 25. Dr. Baker had been associated with the American Can Co., and its subsidiaries since 1906, shortly after his graduation from University of Toronto.



**Dr. H. A. Baker**

### *Other Deaths*

Roberdeau A. McCormick, 84, retired vice-president of McCormick & Co., died suddenly in Baltimore, after a short illness . . . William W. Cobbs, Monsanto research chemist, died from injuries sustained when he fell during a hunting trip ... Charles E. Peterson, 83, former Philadelphia branch manager, Solvay Sales Corp., died at his home in that city . . . March G. Bennett, 71, treasurer and director, Samuel Cabot, Inc., died following an operation in Boston . . . E. A. Smith, 68, president, Smith Fertilizer Co., died suddenly at his home in Statesboro, Ga.

## HEAVY CHEMICALS

### *November Business Tops Fall Volume*

**Chlorates, Oxalic, Silicofluoride in Tight List—First Quarter Contracts Closed—Consumers Buying Forwardly—Alkalies, Plating Items Good—Exports Better—Cuba Now Buying Acids**

NOVEMBER business in heavy chemicals was at the highest rate this fall with many items joining the short brigade. Chlorates, oxalic, silicofluoride, and certain potash salts could be obtained only on contracts at official levels. Copper sulfate and saltcake were tight and strong, but available where needed.

Contracts for next year have been closed by most producers. Chief feature is the desire on the part of most consumers to buy forwardly. This desire seems rooted in the belief that shortages will develop in required items and most users would like to have a little in the bin just in case. There was little news pricewise. Most important items were extended. Isolated rises were confined chiefly to products tied to a rising raw material.

Alkalies are responding to a good demand from the wide variety of industries in which they are used. Expanded in operations in glass, tanning and textile trades have helped considerably, and though lack of export markets is felt, no weakness is expected to develop among the items. Bichromates are being bought forwardly, although some stocks are reported in second hands.

**Plating Chemicals Active**

Plating group is receiving a good call from automotive trade among others. Nickel sulfate is still tight, along with copper sulfate. Normally this is contra-seasonal, and some fears are expressed as to where the agricultural demand will be filled next spring. Calcium chloride moved freely.

Position of the entire list is good. Reliable opinions look for a rise in demand to carry through the winter at least, and point to favorable inventory position as an indication of underlying strength.

Exports to South America have improved. Cuba is now buying muriatic and sulphuric for its sugar season. The projected molasses program also will take sulphuric in large quantities. New factor in exports is Greece with several orders closed during the past few weeks.

### Columbia Chemical Change

Sale of chemical products manufactured by the Pittsburgh Plate Glass Company are now handled by the Company's Columbia Chemical Division. Previously sale of such chemicals as soda ash, caustic soda, and chlorine, was conducted through the Columbia Alkali Corporation, a wholly owned sales division.

**Important Price Changes**

| | Oct. 31 | Nov. 30 |
|---|---|---|
| **ADVANCED** | | |
| Arsenic, white, lb. | \$0.03¼ | \$0.03½ |
| Barium Chlorate, lb. | .30 | .45 |
| Lead Arsenate, lb. | .08½ | .09½ |
| Magnesite, ton | 60.00 | 65.00 |
| Potassium permanganate, USP, lb. | .18½ | .20 |
| **DECLINED** | | |
| Barium Carbonate (Witherite), ton | \$52.50 | \$40.00 |
| Tin, crystals, lb. | .38½ | .38 |
| Tin, Tetrachloride, lb. | .25 | .24¾ |

### Explosives Program Enlarged

Due to the loss of one-third of its powder producing source, through explosion at the Hercules Powder plant at Kenvil, Defense Program officials have ordered construction of two new poder producing units in addition to those now being built at Radford, Va., and Charlestown, In. All new construction is expected to be in operation by next June which would more than double current production.

### Calco's Effluent Plant

A new \$500,000 effluent treatment plant was officially placed in operation at the Bound Brook, N. J., plant by the Calco Chemical Division, American Cyanamid Company on Nov. 7. Governor A. Harry Moore, members of the State Department of Health and Sanitation, as well as various local and company officials were present at the opening.

The development of the new treatment methods used in this plant, was outlined by Dr. V. L. King, Technical Director of Calco, at a luncheon attended by the Governor and the other guests.

### Robinson's New Office

Establishment of a Philadelphia service and sales office in charge of R. V. Schneider of Muncy, Pa., was announced by J. A. Krimm, Vice President and Sales Manager of the Robinson Manufacturing Company, Muncy, Pa. The new office will be located in Room 1247 Commercial Trust Building.

### "Priorities" On Lead

The importance of lead to chemical industries is the theme of the leading story in the December issue of *Priorities*, house organ of Prior Chemical Corporation.

## FINE CHEMICALS

### *Tartrates At Premium In Spot Market*

**Producers Cautious in Filling Orders For Raised Quantities—December May Better Last Year—Mercurials Shipped Steadily—Mercury Easy—Exports to England, South America Good**

FINE chemicals gained added momentum during November. Shipments of one factor are so heavy that they are going directly from production. Seasonals are in vanguard of improved business along with the tight caffiene and theobromine. As was forecast here last month, tartrates have turned scarce and official quotations do not mean a thing in the spot market.

There is plenty of quinine for all domestic demands. Producers, however, continue cautious in handling orders and any abnormal jumps in quantity are sharply questioned. In the words of one seller, "It's the first time this year that we've been able to talk back to a buyer." That just about sums up the present rate of activity.

**Tartar Items Good**

Tartar derivatives were under heavy call, but under normal conditions this volume could easily be handled. Scarcity of argols has contracted tartar supply to a point where it is a spot premium item. Caffiene was reported resold at $5 per pound, with export buyers anxious to take material at that price or higher.

There is a possibility that December will show better than last year on the books of some producers. While 39's last quarter was phenomenal, it is pointed out that most shipments were cleared up by this time and consumers had discovered that there would be no war price boom. That's when the great quiet began which kept business at a snail's pace almost through the first half of this year.

Mercury metal remained easy during the period under review. Little interest was shown in the primary market, although mercurials were shipped steadily, and mercury oxide continues attractive. Producers appear in an enviable position until foreign metal is available. As stated here last month the mercury situation will not be clarified until a few months hence. It is admitted that domestic mines can produce sufficient metal to take care of current requirements. However, it is also admitted that present consumption is abnormally low and has been since dependence was placed on American mines.

Best opinion is that orders will come into the market at a better rate. It is possible also that there will be some competition in the primary market when requirements are not immediately available. There is a distinct probability that delayed shipments will force the market up

**Important Price Changes**

ADVANCED

| | Oct. 31 | Nov. 30 |
|---|---|---|
| Acid tartaric, USP, lb. .. | $0.41¼ | $0.43¼ |
| Cream of tartar, lb. ........ | .34½ | .36¾ |
| Rochelle Salt, powd., lb. | .24¾ | .26¼ |
| Rochelle Salt, cryst., lb. | .25¾ | .27¼ |

DECLINED

None

a few points when the expected demand develops. All mines at present are working against fairly large backlogs. However, it is doubtful whether a few dollars a flask one way or the other will affect mercurial prices.

Exports to the United Kingdom and South America continue to be a factor in the overall picture. While it doesn't approach domestic volume in any sense of the word, the business represents, perhaps, the best export demand in the field.

**Reilly's Acridine Process**

Development of a practical method for producing acridine in substantial quantity out of coal tar has been announced by the Reilly Tar & Chemical Corp., Indianapolis.

Until now, the commercial preparation of acridine, which is the essential molecule in the production of the quinine substitute, atebrin, has been confined to Germany. The production of a so-called synthetic quinine in the United States has assumed vital importance in recent months, it is pointed out by William Higburg, general manager of the Reilly Tar & Chemical, because of war conditions curtailing the importation of quinine made from the bark of the cinchona tree. Fully 90 per cent. of this country's supply of quinine comes from the Dutch East Indies; the remainder from South America.

Atebrin was originally developed by German scientists. It has been subjected to extensive clinical tests with highly satisfactory results as a substitute for quinine in the treatment of malaria.

## COAL TAR CHEMICALS

### *Few Revisions In First Quarter Contracts*

**Industrial Grades of Phenol Reduced 1c—Government Buys Benzol, But Sales Lag Far Behind Production — Toluol Remains Active—Canada's Explosives Plants Future Factor**

FEW revisions were announced in prices on coal tar solvents or derivatives for next year. Notable exception was industrial grades of phenol which were quoted 1c below previous level. Benzol, toluol, and xylol were extended through the first quarter.

Benzol which featured the coal tar news in October by returning to something like normal volume held at that fair level. One government order for 80,000 lbs. was closed during November. This, of course, doesn't help much with present production swelling the surplus built up since early this year. Prices are holding firm, however.

Toluol shipments continue steady against contracts. Supply can best be described as not tight, not plentiful. Automotive trade activity during the months since exports dried up has held material in its good position. However, as pointed out here a few months ago, there is no chance for any weakness to develop. Producers have what amounts to a guarantee that the present price level will be maintained. Government has offered to take any quantities which might become burdensome. Best indication of present business is that the government has yet to place an order.

**Important Price Changes**

ADVANCED

| | Oct. 31 | Nov. 30 |
|---|---|---|
| None | | |

DECLINED

| | Oct. 31 | Nov. 30 |
|---|---|---|
| Acid Cresylic, gal. .......... | $0.75 | $0.70 |
| Phenol, lb. ........................ | .12 | .11 |
| Pyridine, Rfd., lb. ............ | .51 | .48 |

Another cheering factor is the big munitions program being pushed forward rapidly in Canada. The first plant is expected to go into production in February. This will call for toluol in quantities far beyond the limited facilities of Canadian producers. A few orders have already been booked for shipment next year. It is expected that by March, there will be a steady flow of toluol across the border.

Xylol was better than October with the market showing signs of expansion. Phenol remains active with the plastics industry calling for heavy shipments.

Exports remain poor in contrast with first six months. Inquiry seems active enough, but most are considered "feelers." Actual closed business is slight and spotty.

Taken generally, it is a seller's market, and likely to remain so during next year.

## SOLVENTS

### *First Quarter Prices To Be Higher*

**Butyls, Amyls, Isopropyls and Ketones Figure in Advance—Sellers Shipping From Production—Tight Supply For Six Months Is Seen—Petroleums Sold Up—Exports No Factor**

As predicted here last month, contracts for next year will see rises in prices on most of the alcohol solvents. A boost of 1c in ethyl was announced during November—butyls, amyls, isopropyls and ketones will go up after the turn of the year, with official announcement by producers about the time you read this. Acetone will be up 1c in new contracts.

Due to the increased industrial tempo, solvents business has been at a capacity rate for two months. Practically all factors are shipping from production, and in some cases backlogs are becoming evident.

This situation is not likely to change for at least the first six months of next year. As was reported last month, ambitious plans are now underway for expansion, but nothing is likely to develop from this angle until next summer or later.

**No Government Buying**

While it is unquestioned that some of the heavy volume can be traced to defense, the government itself is not in the market. The automotive trade, lacquer, paint, and chemical processing industries are accounting for the lion's share of shipments. Expanded smokeless powder production has broadened activity in ethyl, increased demand for normal industrial uses is by far the greatest factor in the present strong position of this material.

Petroleum solvents continue on a sold up basis, with the lacquer trade still finding them an economical substitute for toluol.

On the export side, some material is moving to Canada and the British Isles. South America is taking some acetone. Foreign buyers however are no factor in the present market. But with domestic demand in its present healthy state, a heavy export demand would probably be considered an annoying complication in many quarters.

### Little Completes Building

Arthur D. Little, Inc., has completed a new chemical engineering building adjacent to its present research laboratories at Cambridge, Mass.

### Electroplating Supplier Adds

Hanson-Van Winkle-Munning Co., manufacturers of electroplating equipment is building an addition to its plant at Matawan, N. J.

**Important Price Changes**

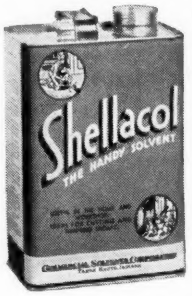
| ADVANCED | Oct. 31 | Nov. 30 |
|---|---|---|
| Alcohol, denat., CD 14, gal. | $0.31½ | $0.32½ |
| Alcohol, denat., SD, No. 1, gal. | .23½ | .24½ |
| Alcohol, ethyl, 190 proof, gal. | 5.93½ | 5.94½ |
| Alcohol, spec. solvent, gal. | .23½ | .25½ |
| Ethyl acetate, lb. | .06 | .06½ |
| DECLINED | | |
| None | | |

### Carbide Starts Expansion

Union Carbide is starting an expansion program at Niagara Falls, N. Y., calling for an expenditure of "several hundred thousand dollars," to increase facilities for handling tungsten, chromium and various other alloys. Construction of one building housing additional handling equipment has already been started, according to officials of the company.

### New Shellacol Package

Commercial Solvents Corp. is now packaging their proprietary solvent, Shellacol, in a one-gallon lithographed can.




This new package was designed primarily for the convenience of the retail dealers who have been purchasing Shellacol in bulk for repackaging in small containers. Illustrations and copy on the can present some of the more important uses for Shellacol, and a leaflet giving further details of these and other uses for the product is packed in each carton of six one-gallon cans.

## PIGMENTS AND FILLERS

### *Cheery Outlook Pervades Market*

**Winter Business Seen Equal to Second Quarter Volume—Paint Trade Has Best Year Since '37—Drop in Lead Catches Consumers Unawares—Carbon Black Prices Are Extended**

There's not a scrap of pessimism to be found in the pigment field, despite the fact that volume slumped off a bit from the exceptionally good fall business. Attitude of most factors can be gleaned from the opinion that business during this winter should keep pace with or better the second quarter of this year. The answer, of course, is military construction and equipment.

Paint trade expects its final figures to show current year as best since 1937. While it would not seem so from the reports of raw material producers during last spring, there was a strong inventory factor to complicate this situation. Most paint manufacturers covered their requirements far into the future at the outbreak of war, protecting themselves against a runaway export market. When this failed to develop, they worked off their overbought stocks.

Exceptional strength in lead which was generally believed to be tied to the defense program proved to be a highly fragile bubble. As November played out, the primary market slumped, lopping off the quarter cent rise which featured derivatives during October. Many consumers were caught unawares on the peak with orders to cover requirements against further rises in the primary market. There is no question but what this latest move will tend to depress volume of new business during December.

**Important Price Changes**

| ADVANCED | Oct. 31 | Nov. 30 |
|---|---|---|
| Casein, dom., lb. | $0.12 | $0.13 |
| Red Lead | .0775 | .0815 |
| DECLINED | | |
| Methyl Cellulose | $0.70 | $0.55 |

Carbon black will remain at the same level for at least the first quarter, it was announced by producers. Shipments have been holding up steadily and no inventories are being established. Rubber trade is the chief buyer. Zinc oxides, titaniums continue to set the pace for pigment field, with volume high on both.

Casein has developed exceptional strength due chiefly to diversion of milk to dry milk and cheese. Prices of both domestic and Argentine material rose fractionally under normal demand. Best opinion holds that prices will stay where they are or thereabouts just so long as flushes remain within bounds.

## RAW MATERIALS

### *Volume Dull But Undertone Remains Firm*

**Prices of Oils Advance Fractionally—Transition From Buyer's Market Seen—Dehydrated Castor is Latest Substitute Drier—Shellac Recovers Sharply—Naval Stores Marking Time**

WITH the exception of dehydrated castor which is being pounced upon as a substitute drier, business was dull in this market during the greater part of November. Buyers are in a "waiting" frame of mind. It has been a buyer's market for so long that consumers can't get accustomed to the idea that a transition is taking place. From the firm tone of the price structure best opinion holds that the turning point has been reached in the market for oils.

During the first week, there was a broad general advance which carried most items up fractionally. Such movements as there were in the following weeks, while more limited, continued the upward trend. However, such a slight advance in a market which has been hovering around its low point could be expected in the light of broadening national business. Nothing like a runaway market is predicted anywhere, but the general feeling is that most items in the group could lift themselves a bit more with normal volume which is expected early next year.

**Imports Scarce**

The imported driers were lightly offered, and inquiry was limited. Prices held steady. Chinawood was holding its own with some inquiry but little business passing.

Shellac which lost half of its consumers when the war struck the low countries rallied greatly as Calcutta crops were reported off 50 per cent. Material previously had slumped badly on reports of a heavy crop. The new estimate was revealed almost immediately and the market leaped. It was a very timely coincidence—if nothing more.

Waxes maintained their firm position. a condition brought about by fair demand and moderate stocks.

**Naval Stores**

There has been a let-down in activity on the Savannah Exchange occasioned by the expected announcement of C.C.C. loan values on turpentine and rosin. Best reports are that turpentine will command a loan value of 30c, an increase of 7c over 1940 value. There was some dissatisfaction with this report, however, inasmuch as many factors had anticipated loans on a 35c basis. Rosin loan basis is expected to be reduced.

Turpentine retains its favorable position although the loan value announcement is expected to have a depressing effect for a time. Rosin prices have been climbing steadily in the face of light volume, and the same reaction is expected in this commodity when the reduced loan value becomes official.

On the other hand, it is understood that four ships will leave Jacksonville with good cargoes of rosin and turpentine destined for England.

**Important Price Changes**

ADVANCED

| | Oct. 31 | Nov. 30 |
|---|---|---|
| Oil Linseed, tks., lb. | $0.077 | $0.081 |
| Menhaden, tks., lb. | .073 | .080 |
| Neatsfoot, pure, lb. | .08 | .10¾ |
| Olive, denat., gal. | 2.10 | 2.40 |
| Olive, edible, gal. | 3.00 | 3.25 |
| Soybean, crude, lb. | .04¾ | .05¼ |
| Wax, bees, Brazil, lb. | .30 | .31 |
| Carnauba No. 3, Chalky, lb. | .59 | .62 |
| Japan, lb. | .18 | .18½ |

DECLINED

| | Oct. 31 | Nov. 30 |
|---|---|---|
| Acid stearic, double pressed, lb. | $0.10 | $0.09½ |
| Oil, peanut, crude, lb. | .05¼ | .05⅛ |
| Rosins | general decreases | |
| Turpentine (spirits), gal. | .43¾ | .43½ |

**No Fertilizer Shortage**

There will be no shortage of fertilizer supplies in the present emergency of national defense such as confronted the Nation during the period of the great World War, the fertilizer industry informed the Council of National Defense in a resolution passed at the November convention of The National Fertilizer Association. The resolution reads, in part:

"The commercial fertilizer industry of the United States is prepared to furnish all of the chemical plantfood which may be needed during the present national emergency, even if conditions during the next few years should make necessary an increase in crop production, with a consequent increase in the demand for fertilizer," states the resolution.

"The situation which now confronts the country, in regard to supplies of commercial fertilizer, both actual and potential, is quite different from that which existed at the time of the great war. Developments since that time have made this country self-sufficient and independent with reference to our potash needs, have provided substantial capacity for the production of nitrate of soda and made it possible readily to expand this capacity, have released a considerable portion he sulphuric acid formerly required the production of nitric acid for explosives."

## AGRICULTURAL CHEMICALS

### *Slight Firming of Prices Believed Due*

**Early Mixing Volume Expected Because of Uncertain Supply Situation—Organics Hold Good Position—Menhaden Unavailable—Ammonia Sulfate Is Tight—Potash In Better Supply**

POSSIBILITY of an early shipping season was seen in some quarters of the market. Forecasters point to sensitivity developing because of the supply situation. It is expected that when full volume appears there is better than even chance of a slight firming up among the so-called minor items.

Some mixers advanced their operations as reported last month, and this is expected to become the rule rather than the exception. Heavy demand for organics from feed suppliers is an additional factor which should bring in mixing volume. Blood advanced during the period under review, and there was no relief during the past month on fish scrap. Menhaden is unavailable. Bone, on light volume, remained in a firm position, and there are some who look upon the eventual supply situation as a bullish factor.

Nitrate of soda remains on the inactive list with the shipping season still a month away. When the season actually starts there may be interesting developments.

**Important Price Changes**

ADVANCED

| | Oct. 31 | Nov. 30 |
|---|---|---|
| Blood, dried, unit | $2.40 | $2.50 |
| Hoof meal, unit | 2.00 | 2.20 |

DECLINED

None

Cyanamid shipments have been moving slowly, with but little material available.

Ammonia sulfate retains all its glamor for buyers. Export dealers are offering prices well above the market without arousing the slightest interest in their lavish bids. Production is moving to regular contract consumers; slight expansion in production having meant nothing as far as supply is concerned.

Potash is in a somewhat better supply, although shipments have been rather slow during November. It is expected that there will be sufficient material available within a few months to take up the slack occasioned when foreign suppliers bowed out of the picture.

## *Booklets & Catalogs*

### Chemicals

**A245. The Aroclors;** 20-page booklet containing descriptions and diagrammatic illustrations of this group of products which have been used as flame retarding ingredients, plasticizers, thermostat control media, softeners, solvents, plastics, lubricants, adhesives, organic pigments, lacquer ingredients, etc. Monsanto Chemical Co.

**A246. Industrial Finishing, Vol. 1, No. 1;** A new publication for users of industrial finishes. Contains illustrated news items of developments in this field. The Sherwin-Williams Co.

**A247. Phosphates;** 48-page booklet giving properties, containers and uses of products marketed by Phosphate Division. Monsanto Chemical Co.

**A248. The Pioneer;** Three interesting applications of chlorine; the development of chlorine disinfected playground sandpits, the use of antiseptic wall paints containing chlorine, the use of chlorine in textile wetting, dispersing and penetrating processes. Electro Bleaching Gas Co., and Niagara Alkali Co.

**A249. Plexiglas.** The properties and applications of acrylic resins are described and interestingly illustrated. Rohm & Haas Co., Inc.

**A250. Services and Chemicals;** Lists and gives specifications for a number of new organic chemicals. The Edwal Laboratories, Inc.

**A251. Synthetic Organic Chemicals; Tenth Edition, October 15, 1940.** Presents in condensed form the properties, uses, and specifications for 142 new organic chemicals. A comprehensive reference manual of industrial organic chemistry. Carbide and Carbon Chemicals Corp.

### Equipment—Containers

**E361. Bottling Equipment, Bulletin No. 3;** Description and illustration of factory rebuilt equipment. Crown Cork and Seal Co.

**E362. Bronze Steam Hose and Clincher Couplings, Bulletin 52-G;** Descriptive engineering literature, prices and other data. Pennsylvania Flexible Metallic Tubing Co.

**E363. Drug, Cosmetic and Pharmaceutical Machinery, Catalog No. 10-A;** 40-page booklet of complete line of equipment for these industries. Charles Ross & Son Co.

**E364. Electric Flow Meters, Catalog No. 2007;** Covers complete line of flow meters for measurement and control of steam, air, oil, water, chemicals, and other fluids. Schematic diagrams are given and outstanding design features described. The Brown Instrument Co.

**E365. Flomix;** Describes piece of equipment designed to be installed in a pipe line to mix liquids flowing through that line. New England Tank and Tower Co.

**E366. Galvanized Steel Hose and Couplings, Bulletin 59-G;** Descriptive engineering literature. Pennsylvania Flexible Metallic Tubing Co.

**E367. High Pressure Flexible All-Metal Tubing, Bulletin 90;** Describes, illustrates and gives specifications, also suggests some applications. Pennsylvania Flexible Metallic Tubing Co.

**E368. In Case of Fire;** 8 pages, 2 colors, illustrated, describes use of carbon dioxide for fire extinguishment. C-O-Two Fire Equipment Co.

**E369. Kneading and Mixing Machinery, catalog No. 14-D;** 40-page illustrated catalog describing kneading and mixing equipment for specific industries. Charles Ross & Son Co.

**E370. Lifting Devices.** All types of lifting and hoisting devices for use in factories, warehouses, stores and machine shops are shown and described in 32-page catalog. Economy Engineering Co.

**E371. Manual of Welding and Fabricating Procedures;** Descriptive booklet of welding and fabricating techniques for Ingaclad Stainless Clad Steel. Ingersoll Steel & Disc. Division, Borg-Warner Corp.

**E372. Pneumatic Versus Mechanical Throttling Range;** A discussion of pneumatically operated automatic control mechanisms by R. A. Rockwell. The Foxboro Co.

**E373. Practical Pumping Problems;** illustrated booklet containing comprehensive information on pumps and pump parts, discusses in detail the uses of Monel, "K" Monel, and "S" Monel for pump parts. The International Nickel Co., Inc.

**Chemical Industries**
**522 5th Avenue**
**New York City**

**I would like to receive the following booklets:**

..................................................................

..................................................................

**Name** ..........................................................

**Title** ..........................................................

**Company** ......................................................

**Address** .......................................................

**All information requested above *must* be given to receive attention.**

# Foreign Literature DIGEST

*By*

T. E. R. Singer

BOLETIN DE OBRAS SANITARIAS DE LA NACION BUENOS AIRES, *IV*, No. 39, Sept. 1940, p. 257-267.

R. A. Trelles and J. M. Bach discuss the problem of eliminating fluorine from drinking water. They describe the ill effects of too much fluorine on teeth and bones. A certain very small content of the element in water seems to be only beneficial. Several examples (with diagrams) are given of cisterns built to store drinking water safely. The following proposed methods for correcting fluorine-containing water are given: 1) the formation of an adsorbing substance during purification of the water—magnesia treatment, aluminum sulfate coagulation, lime and phosphoric acid treatment. 2) Prolonged mixing of water with an active substance—activated and active carbons, tricalcium phosphate, magnesium oxide or hydroxide; 3) Filtration of the water through an active filtration medium—activated alumina, a specially prepared porous, granulated tricalcium phosphate, specially treated bone, activated bauxite.

Same journal, *IV*, No. 38, August 1940. p. 152-160.

U. M. Cuneo discusses modern methods of sewage treatment. A table is given listing sewage treatment plants at various American cities, the type of treatment used, the cost of the plant and other statistical data. A diagram is given for a sewage disposal plant using beds of activated muds. Sedimentation and aeration tanks are discussed and data given on their dimensions, etc.

*Kunststoffe*, Jahrg. 30, No. 2, July 1940, pages 193-199, contains the second report by W. Kunstze, R. Nitsche and H. von Mertens on the resistance of plastic materials to impact bending. These tests were carried out principally on cellulose derivatives and vinyl polymers, and the article contains many curves and tables of results, as well as illustrations of impact fractures produced. In the same issue (pages 200-202) Otto Meisinger contributes an article on the mathematical calculations required in the designing of suitable compression and extrusion moulds. Hans Gastrow, also in the same issue (pages 203-206) gives a short, illustrated history of extrusion moulding, starting with the oldest steam operated press of 1872, which refers to U. S. patent 133,-229 down to modern German machines. Albert Sander (pages 207-210) has an article, illustrated with photographs, of plastics at the Milan, Italy, Spring exhibition. In the August issue of this periodical, pages 221-223, A. V. Blom of Zurich has published an address given at the Breslau congress exhibition in July, on corrosion of plastics. In the same issue Karl Mienes contributes a history of the production, working and utilization of plastic materials, with photographic illustrations of laboratory and industrial apparatus made of various types of plastics, as well as small household appliances constructed of similar materials. On the scientific side L. Kollek has an article in this issue (pages 229-232) on the properties and uses of the newer vinyl plastics. Wilhelm Esch and Rudolf Nitsche of the State material testing office at Berlin-Dahlem contribute a laboratory process for the testing of the *Buna* synthetic rubbers S and SS. The September issue of this periodical, with consideration of the raw material shortage in Germany has an article on pages 253-256 by F. Stather and H. Herfeld, which treats in some detail, on the possibilities of the use of synthetic materials in place of leather. A. Schwittmann, on pages 261-264, has an article on the influence of flowing conditions on the mixing of plastic materials with fillers before pressing. A report on X-ray tests of plastic materials, illustrated with photographs, is contributed by H. Steul on pages 265-266. With the present interest in photographic lenses, and lenses for other purposes, the detailed, illustrated article on pages 267-273, by Kurt Frölich on the optical applicability of organic glasses, is of especial interest.

ADVERTISEMENT—*This entire page is a paid advertisement.*

*Prepared Monthly by U. S. Industrial Chemicals, Inc.*

# U.S.I. CHEMICAL NEWS

December ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1940

## See New Vanadium Source in Western Phosphate Rocks

### Economical Recovery Possible By Solvent Extraction Process

LEONIA, N. J.—The phosphate deposits of Wyoming, Utah, Idaho, and Montana offer a source from which vanadium can be economically extracted, it is claimed in a patent granted jointly to inventors here and in New York. Efficiency of the process, it is said, depends on the use of solvents.

Western phosphate rock, it is said, has taken on greater importance as a source of phosphoric acid, as a result of increased demand for the acid in the manufacture of "double" and "triple" superphosphates. It is known that these rocks contain an appreciable amount of vanadium, which appears in the final phosphoric acid solution.

**Converted to Pentoxide**

The inventors propose to recover the vanadium content by a method that is described as simple and effective. The vanadium content of the acid solution is first converted to the pentoxide form by an oxidizing agent such as potassium persulphate. The vanadium content is then extracted, it is claimed, by the action of a selective solvent. Suitable solvents, according to the inventors, include ethyl ether, isopropyl ether, ethyl acetate,

(*Continued on next page*)

## *New Coating Makes Paper Moisture- and Odor-proof*

WILMINGTON, Del.—A new composition that can be applied to paper in a continuous film makes the paper substantially proof against moisture, odors, and vapors, according to a manufacturer here.

Basis of the coating is said to be a granular white material, made by completely reacting chlorine and pure, pale crepe rubber. It is said that the material is soluble in many common solvents and that it deposits clear films.

For paper coatings, the material is usually mixed with a plasticizer such as dibutyl phthalate, it is reported. Dibutyl phthalate is chosen, according to the manufacturer, because it helps to develop excellent moisture- and vapor-proofness in the finished coating. In addition, it has the advantage of being free from odor.

**Dibutyl Phthalate is produced by U.S.I.**

## Report Ethyl Cellulose Improves Spirit Varnish

LOUISVILLE, Ky.—Moisture resistance, hardness, and abrasion resistance of spirit varnishes can be substantially improved by substituting ethyl cellulose for small percentages of the resin content, it is indicated by investigations carried on here.

Studies were made of pontianak and Manila resins, using a solvent consisting of 75% alcohol and 25% toluene. All qualities investigated showed substantial improvement, it is claimed, when ethyl cellulose was added.

# New Acetone Uses Found, Sales Volume Continues on Up Trend

### Demand Continues Strong in Existing Fields, Many Additional Markets Seen in Novel Solvent and Raw Material Applications

Uncovery of many novel applications for acetone is combining with continued demand in established fields to maintain sales at a high level for this widely used U.S.I. product. Export markets are up, as well as domestic, and acetone exports for the first half of the current year jumped to 12,128,410 pounds from a figure of 8,159,890 pounds for the same period last year. Many of the newer uses of acetone make use of its solvent properties; in other cases it is employed as a raw material for chemical manufacturing processes.

The rayon industry remains one of the largest users of acetone, and it is estimated that the consumption in rayon and allied fields in 1940 will reach a figure of 32,000 tons. Even in such well established fields as this, new acetone applications are coming to light, and a recent patent described a method for producing rayon yarns of improved extensibility, employing acetone.

**Applications in Cellulose Field**

Moistureproofing of regenerated cellulose sheets can be effected, it is claimed, by treating the sheets with acetone, which is said to displace existing liquids in the surface layers of the sheets. The sheets are then impregnated with a succinic acid-glycerol resin dissolved in acetone. A process for dyeing cellulose derivatives is said to consist in dissolving them in acetone with a diazogene compound and a coupling component.

Among the established uses of acetone, its application as a solvent for acetylene is a very important one. It is the most economical solvent known for this purpose, dissolving 25 times its own volume at ordinary temperatures and pressures. Other solvent uses include dry cleaning fluids, paint and varnish removers, natural and synthetic resins, bituminous paints, smokeless powder, TNT, artificial leather, lacquers, and dopes. A novel use is in the recovery of copper in the wire drawing process. The oily sludge

(*Continued on next page*)

## *U.S.I. Widens Its List Of Acetoacet-arylides*

U.S.I. announces that the following acetoacet-arylides are now in regular production:

- Acetoacet-anilide
- Acetoacet-ortho-chloranilide
- Acetoacet-ortho-toluidide
- Acetoacet-para-chloranilide
- Acetoacet-ortho-anisidide

**Laboratory or pilot plant samples have been prepared of these additional items, which can be made in larger quantities if sufficient demand appears:**

- Acetoacet-para-phenetidide
- Benzoylacet-anilide
- Biacetoacetyl-meta-toluylenediamine
- Biacetoacetyl-para-phenylenediamine
- Acetoacet-para-nitroanilide
- Acetoacet-2,5-dichloranilide
- Acetoacetyl-alpha-naphthylamine
- Acetoacet-cumidide (pseudo)
- *N, N'*-Biacetoacetbenzidide

In addition to these products, on which inquiries are invited, U.S.I. is in a position to make laboratory samples of other acetoacet-arylides at the suggestion of prospective customers.

## Produces "Synthetic" Hardwood

RIDGEFIELD PARK, N. J.—A product similar to hardwood can be prepared by a process for injecting natural or synthetic resins into green wood, at the same time extracting the sap and moisture, it is reported here.

The "synthetic" hardwood, it is claimed, is resistant to warping, rotting, and fire, and can be produced at lower cost than the natural hardwoods it is intended to replace.

**Solvent in the manufacture of artificial textiles, vehicle in liniments—these represent two of the extraordinarily diversified uses of acetone.**

December ★ **U.S.I. CHEMICAL NEWS** ★ 1940

## Drying Components of Marine Oils Extracted By Ethyl Acetoacetate

MILWAUKEE, Wis.—A novel application for ethyl acetoacetate in extracting the drying constituents of fish oils is revealed in a patent granted to an inventor here.

Ethyl acetoacetate is particularly valuable in refining raw oils such as sardine or menhaden, according to the inventor, because it dissolves most of the unsaturated components which are useful in paints and varnishes, while at the same time it has low solvent powers for the undesirable "break" and color constituents.

**Ethyl Acetoacetate is produced by U.S.I.**

## *Acetone Sales Volume Up*

(*Continued from previous page*)

resulting in the drawing process is extracted with acetone, it is said, removing the oil and leaving a residue of fine copper powder. A patented plastic wood composition is said to incorporate vinyl resins and acetone.

As a raw material for chemical manufacture, acetone has exceptional potentialities. Benzylidine, bromoform, chlorbutanol, chloracetone, diacetone, chloroform, iodoform, indigo, ionone, isoprene, and mesityl oxide are among the more familiar compounds that can be produced from acetone. Oxidation inhibitors for rubber are commonly prepared by the reaction of acetone with an aromatic amine. A recent patent in this field covers an inhibitor prepared by heating acetone and a *p*-amino-substituted diaryl thio ether in the presence of iodine. A new gum inhibitor for oils and cracked gasoline is described as a reaction product of acetone and pyrocatechol.

### Preparation of Bis-phenols

Still other uses for acetone include a process for preparing bis-phenols by treating phenols with acetone in the presence of an inorganic acid; manufacture of ketene and its homologs by pyrolysis of acetone in contact with copper; preparation of fusible resins by treating an aldehyde with acetone in the presence of a catalyst.

In the medical field, acetone is extensively used as a vehicle for liniments and in the treatment of purulent wounds. This, of course, is in addition to the medical use of many of the compounds already mentioned, in which acetone is used as a raw material.

As a leading producer of solvents, U.S.I. supplies acetone of the highest quality for these diversified requirements.

## *Here's Pleasant News For Cigarette Smokers*

SOUTH ORANGE, N. J.—No loose shreds of tobacco will find their way into your mouth if the end of your cigarette is impregnated with a solution of ethyl cellulose in anhydrous ethyl alcohol, it is claimed by an inventor here. The solution, it is said, stiffens and waterproofs the paper at the mouth end of the cigarette, and binds the tobacco shreds together so that they do not become loose.

The inventor also claims that the composition is non-toxic and has absolutely no effect on the taste or odor of the smoke. Best news of all is the claim that absent-mindedly lighting the wrong end produces no ill effects.

**U.S.I. is a leading producer of Anhydrous Ethyl Alcohol.**

## Claims Pipe Seal Immune To Alcohol, Oils, Steam

BROOKLYN, N. Y.—Use of blown castor oil, produced by oxidizing or polymerizing raw castor oil, is desirable in packing and sealing compounds exposed to heat, vibration, and chemicals, it is claimed in a patent granted to an inventor here.

The blown castor oil, the inventor claims, is substantially insoluble in gasoline, gasoline-alcohol mixtures, fuel oils, and alcohol-containing preparations, such as anti-freeze. Moreover, it is said that the seal is not affected by heat, hot water, or steam.

A typical composition is said to have the following proportions:

| | |
|---|---|
| Philippine gum | 6 lbs. |
| Ethyl alcohol | 1 gal. |
| Blown castor oil | 1½ gal. |
| Talc | 25 lbs. |

## *Vanadium Recovery Process*

(*Continued from previous page*)

butyl acetate, and a number of other organic compounds.

Several methods have been proposed for recovering the metal values from the organic solution. For example, it is said that the solution may be brought in contact with water, allowing a certain quantity of the metal value to pass into the aqueous phase. The vanadium in the water phase can then be reduced to the tetravalent state, in which it is largely insoluble in the organic solvent, and the water phase can be recycled.

**Ethyl Ether, Ethyl Acetate, and Butyl Acetate are produced by U.S.I.**

## TECHNICAL DEVELOPMENTS

*Further information on these items may be obtained by writing to U.S.I.*

**New rust preventives** are said to incorporate an ingredient that provides a homogeneous, non-crystalline film, with a high degree of conesion and adhesion to metal. It is reported that products can be supplied to meet industrial specifications. **(No. 400)**

U S I

**A transparent floor finish** is unaffected by extreme conditions of acidity or alkalinity, according to the maker. It is claimed that dried films of the product have been immersed in dilute sulphuric acid, carbolic acid, and sodium hydroxide solutions without damage to finish or gloss. **(No. 401).**

U S I

**Fugitive tints** for identifying cotton, viscose, and acetate staple fibers are described as oil-soluble dye concentrates to be added to the oil used in conditioning cut staple fibers. Eight colors are said to be available. **(No. 402)**

U S I

**Sodium chlorite** is said to be strong enough to bleach cotton, rayon, wood pulp and other cellulose fibers, without attacking the fibers themselves. It is claimed that the sodium chlorite will bleach in both acid and alkaline solutions. **(No. 403)**

U S I

**Textile colors** can be applied directly to cotton, rayon, acetate, and other fabrics by standard textile printing machinery, and require no after-treatment, it is claimed. It is said that the colors have excellent fastness to light and to repeated washings. **(No. 404)**

U S I

**A mildew preventive** is said to be especially designed for incorporation in paints and plastic materials to prevent the growth of mold, mildew, spores, and algae. It is also claimed that the product promotes even spreading, increases adhesion and flexibility of paint film. **(No. 405)**

U S I

**A new ink** that is said to be especially suitable for laundry marking is described as resistant to soap, lye, bleaching fluid, and oxalic acid. **(No. 406)**

U S I

**Stable emulsions** of mineral oil, pine, oil, toluol, and other oils and waxes, containing as high as 6% hydrochloric acid and other strong electrolytes, have been prepared with the aid of a new emulsifying agent, it is claimed. Applications are said to include paper, leather, textile, and cosmetic industries. **(No. 407)**

U S I

**Water-treating equipment** is said to have been developed for removing carbon dioxide from water that has been treated in carbonaceous hydrogen zeolite softeners. It is claimed that the treatment also oxidizes any soluble iron present, so that it can be filtered out. **(No. 408)**

U S I

**A deep black finish** can be produced on steel by a new low-temperature process, it is claimed. It is said that the dimensions of treated parts remain unchanged, and that the finish is resistant to rust and wear. It is also reported that temperatures used are not high enough to affect heat-treated parts. **(No. 409)**

## *Industry's Bookshelf*

**Kingzett's Chemical Encyclopaedia,** Sixth Edition, Revised and Edited by Ralph K. Strong, Ph.D., D. Van Nostrand Co., Inc., New York, N. Y., 1088 pages, $14.00. In this encyclopaedia numerous scientific terms, chemical names, trade names are listed, described and discussed. The editor has kept in mind the fine points of previous editions and has tried to preserve as much as possibe of the style that made them popular. Recent progress in the field has been incorporated and extensions and revision of the older listings have been made. Graphical, and tabular data regarding some of the most important chemical substances and reactions have been extended and added to make the work more useful and illuminating.

**Handbook for Chemical Patents,** by Edward Thomas; Chemical Publishing Co., Inc., New York, 270 pages, $4.00. This book is offered both as a handbook for the general reader interested in chemical patents and as a supplement to the author's earlier "Law of Chemical Patents" to enable attorneys and inventors rapidly to locate cases on chemical inventions decided since about the middle of 1937. While the subject matter is arranged in logical sequence and presented in clear and simple—albeit at times inelegant—language, its use is rendered difficult. In certain chapters as many as three-fourths of the references are to the author's previous work instead of to the original sources, with the result that the book is of little value to those not already in possession of the earlier book. Those who have it can make good use of the present one as a supplement. Appendix I offers suggestions for exploiting chemical inventions, and Appendix II reproduces four typical chemical patents. The book clearly shows having been prepared by an able and experienced practitioner in chemical patents. *Reviewed by E. L. Luaces.*

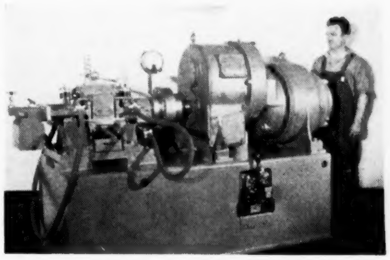
**Laboratory Manual of Biochemistry,** by Benjamin Harrow, Gilbert C. H. Stone, Ernest Borek, Harry Wagreich, and Abraham Mazur; W. B. Saunders Company, Philadelphia, Pa, 119 pages. As the title implies the purpose of this manual is to provide simple experiments which will demonstrate certain phases of the subject matter. The book is well planned and written, with the outlines and procedures for the various experiments especially clear and easy to follow.

## NEW EQUIPMENT

### Rubber, Plastics Mixer QC 96

The Banbury Mixer is so generally used in the rubber industry and certain branches of the plastics industry that there is a definite need for a smaller Banbury with which the plant chemist can do experimental and research laboratory work to develop new formulas and improve old ones and determine the best procedures for handling stocks in the larger sized Banbury Mixers used in actual production.

This need is met by the Banbury Laboratory Mixers, which are made in several sizes.



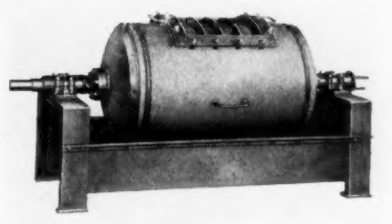
These mixers are designed on the same principles as the larger production models, but have been simplified to adapt them for laboratory use. They will produce mixes on an experimental scale comparable to those obtained with the production sizes and enable the chemist to determine accurately and economically the characteristics of new formulas before putting them into production.

They can be used not only for experimental mixing of small batches of rubber but also for asphaltic materials, phenolic condensation products, resinous compounds, paints, enamels, lacquers and other plastic materials.

### Vacuum Dryer QC 97

A rotary dryer of unique design for chemicals and other process materials has recently been built for a prominent manufacturer of pharmaceuticals and fine chemicals.

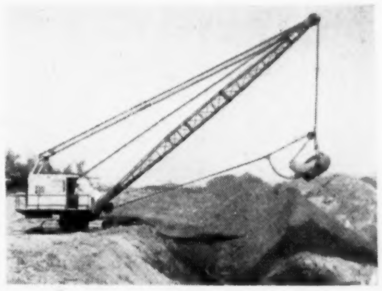
The all stainless steel drying drum-32" O. D. and 54" long has a cylinder welded to dished heads. Through the stuffing box at one end of the drum a stainless steel vacuum pipe outlet permits the removal of vapors during drying. The drum rotates over a trough like galvanized steel stand at the bottom of which are a series of steam pipes used for supplying the heating medium. By rotating the drum over the radiated heat from the steam pipes, the material in the dryer is subjected to uniform exposure to the heat absorbed by the drum, thereby assuring uniform drying, at a uniform rate. In place of steam, gas or electric heating



may be provided. The series of swing bolts which hold the reinforced, ribbed stainless steel cover in place are easily loosened allowing the cover to be quickly removed and the drum tilted into position for removal of material and recharging of the dryer.

### Crawler Miner QC 98

Fertilizer companies experiencing difficulties in handling the problems of stripping, probing, digging and loading phosphate or others who come up against similar difficulties should be interested in this piece of equipment. The "crawling miner," as it has been called is equipped with a one and one-half yard shovel, and tractor type crawlers that give the ma-



chine stability for digging and maneuvering. It is said to average about 3000-4000 yards per day.

**Chemical Industries**
**522 Fifth Ave., N. Y. City.**

**I would like to receive more detailed information on the following equipment: (Kindly check those desired.)**

**QC 96** **QC 97**

**QC 98**

**Name** ..........................................

**Title** .................... **Company** ....................

**Address** ..........................................

*Heavy Chemicals, Coal-Tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.*

# PRICES CURRENT

**Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.**

**Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.**

**Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.**

**The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.**

**Purchasing Power of the Dollar: 1926 Average—$1.00 - 1939 Average $1.24 - Jan. 1940 $1.17 · Nov. 1940 $1.19**

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Acetaldehyde, drs, c-l, wks lb. | ... | .11 | ... | .11 | .10 | .14 |
| Acetaldol, 95%, 55 gal drs wks lb. | .11 | .12 | .11 | .25 | .21 | .25 |
| Acetamide, tech, lcl, kgs lb. | .28 | .30 | .28 | .50 | .28 | .50 |
| Acetanilid, tech, 150 lb bbls lb. | .29 | .31 | .27 | .31 | .22 | .29 |
| Acetic Anhydride, drs, f.o.b. wks, frt all'd lb. | .10½ | .11½ | .10½ | .11½ | .10½ | .11 |
| Acetin, tech, drs lb. | ... | .33 | ... | .33 | ... | .33 |
| Acetone, tks, f.o.b. wks, frt all'd lb. | ... | .05 | .05 | .06 | .04¼ | .06 |
| drs, c-l, f.o.b. wks, frt all'd lb. | ... | .06½ | .06½ | .07½ | .05¾ | .07¼ |
| Acetyl chloride, 100 lb cbys lb | .55 | .68 | .55 | .68 | .55 | .68 |
| **ACIDS** | | | | | | |
| Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs. | ... | 2.23 | ... | 2.23 | ... | 2.23 |
| glacial, bbls, c-l, wks 100 lbs. | ... | 7.62 | ... | 7.62 | ... | 7.62 |
| glacial, USP bbls, c-l, wks 100 lbs. | ... | 10.25 | ... | 10.25 | ... | 10.25 |
| Acetic Acid Glacial, *Synthetic* 99.5%, cbys, cases, delv lb. | ... | .0918 | ... | ... | ... | ... |
| 99.5%, 110-gal dr, delv lb. | ... | .0843 | ... | ... | ... | ... |
| USP XI, cases, cbys, delv lb. | ... | .11 | ... | ... | ... | ... |
| USP XI, 110-gal drs, delv lb. | .10¼ | .11 | ... | ... | ... | ... |
| CP, cases, cbys, delv lb. | .13½ | .14 | ... | ... | ... | ... |
| CP, 55-gal drs, delv lb. | .13¼ | .13½ | ... | ... | ... | ... |
| Acetylsalicylic, USP, 225 lb. bbls lb. | ... | .45 | ... | .45 | .40 | .50 |
| Adipic, kgs, bbls lb. | ... | .31 | .31 | .72 | ... | .72 |
| Anthranilic, ref'd, bbls lb. | 1.15 | 1.20 | 1.15 | 1.20 | 1.15 | 1.20 |
| tech bbls lb. | .. | .75 | ... | .75 | ... | .75 |
| Ascorbic, bot oz. | 2.00 | 2.05 | 2.25 | 3.00 | 2.75 | 3.25 |
| Battery, cbys, wks 100 lbs. | 1.60 | 2.55 | 1.60 | 2.55 | 1.60 | 2.55 |
| Benzoic, tech, 100 lb kgs lb. | .43 | .47 | .43 | .47 | .43 | .47 |
| USP, 100 lb kgs lb. | .54 | .59 | .54 | .59 | .54 | .59 |
| Boric, tech, gran, 80 tons, bgs, delv ton *a* | 93.50 | 96.00 | ... | 96.00 | ... | 96.00 |
| Broenner's, bbls lb. | .. | 1.11 | ... | 1.11 | ... | 1.11 |
| Butyric, edible, c-l, wks, cbys lb. | 1.20 | 1.30 | 1.20 | 1.30 | 1.20 | 1.30 |
| synthetic, c-l, drs, wks lb. | ... | .22 | ... | .22 | ... | .22 |
| wks, lcl lb. | ... | .23 | ... | .23 | ... | .23 |
| tks, wks lb. | ... | .21 | ... | .21 | ... | .21 |
| Caproic, normal, drs lb. | .30 | .35 | .35 | .40 | ... | .35 |
| Chicago, bbls lb. | ... | 2.10 | ... | 2.10 | ... | 2.10 |
| Chlorosulfonic, 1500 lb drs. wks lb. | .03½ | .05 | .03½ | .05 | .03½ | .05 |
| Chromic, 99¾%, drs, delv lb. | .15¼ | .17¼ | .15¼ | .17¼ | .15¼ | .17¼ |
| Citric, USP, crys, 230 lb bbls. lb. *b* | .20 | .21 | .20 | .21½ | .20 | .22½ |
| anhyd, gran bbls lb. *b* | ... | .23 | ... | .23 | .23 | .25 |
| Cleve's, 250 lb bbls lb. | ... | .57 | ... | .57 | ... | .57 |
| Cresylic, 99%, straw, HB, drs, wks, frt equal gal. | .68 | .70 | .68 | .70 | .49 | .70 |
| 99%, straw, LB, drs, wks, frt equal gal. | .68 | .70 | .68 | .75 | .55 | .75 |
| resin grade, drs, wks, frt equal lb. | .08¾ | .09¾ | .08¾ | .09¾ | .08¾ | .09¾ |
| Crotonic, bbls, delv lb. | .21 | .50 | .21 | .50 | .21 | .50 |
| Formic, tech, 140 lb drs lb. | .10½ | .11½ | .10½ | .11½ | .10½ | .11½ |
| Fumaric, bbls lb. | .24 | .28 | .24 | .75 | ... | .75 |
| Fuming, see Sulfuric (Oleum) | | | | | | |
| Gallic, tech, bbls lb. | .90 | .93 | .75 | .93 | .70 | .73 |
| USP, bbls lb. | .92 | .95 | .92 | .95 | .77 | .81 |
| H, 225 lb bbls, wks lb. | ... | .45 | | .45 | .50 | .55 |
| Hydriodic, USP 47% lb. | ... | 2.42 | 2.30 | 2.42 | ... | 2.30 |
| Hydrobromic, 34% conct 155 lb cbys, wks lb. | .35 | ... | .35 | .44 | .42 | .44 |
| Hydrochloric, see muriatic | | | | | | |
| Hydrofluoric, 30%, 400 lb bbls, wks lb. | .06 | .06½ | .06 | .06½ | .06 | .07½ |
| Hydrofluosilicic, 35%, 400 bbls, wks lb. | .09 | .09¼ | .09 | .09½ | .09 | .09½ |
| Lactic, 22%, dark, 500 lb bbls lb. | .02½ | .03¼ | .02½ | .03¼ | .02½ | .02¾ |
| 22%, light ref'd, bbls lb. | .03½ | .04¾ | .03½ | .04¾ | .03½ | .03¾ |
| 44%, light, 500 lb bbls lb. | .06½ | .07¼ | .06½ | .07¾ | .05½ | .05¾ |
| 44%, dark, 500 lb bbls lb. | .05½ | .06¾ | .05½ | .06¾ | .06½ | .06¾ |
| 50%, water white, 500 lb bbls lb. | .10½ | .11½ | .10½ | .11½ | .10½ | .11½ |
| Lauric, drs lb. | .12 | .12½ | .12 | .14½ | .11¾ | .12¼ |
| Laurent's, 250 lb bbls lb. | ... | .45 | .45 | .46 | .45 | .46 |
| Maleic, powd, kgs lb. | ... | .30 | .30 | .40 | .30 | .40 |
| Malic, powd, kgs lb. | ... | .47 | ... | .47 | .45 | .60 |
| Mixed, tks, wks N unit | .05 | .06 | .05 | .07¼ | .06½ | .07¼ |
| S unit | .0085 | .009 | .008 | .009 | .008 | .009 |
| Monochloracetic, tech, bbls lb. | .15 | .18 | .15 | .18 | .16 | .18 |
| Monosulfonic, bbls lb. | ... | 1.50 | 1.50 | 1.60 | 1.50 | 1.60 |

*a* Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; *y* Price given is per gal.

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb. | ... | 1.50 | .. | 1.50 | ... | 1.50 |
| tks, wks 100 lb. | ... | 1.05 | 1.00 | 1.05 | ... | 1.00 |
| 20°, cbys, c-l, wks 100 lb. | ... | 1.75 | ... | 1.75 | ... | 1.75 |
| tks, wks 100 lb. | ... | 1.15 | 1.10 | 1.15 | ... | 1.10 |
| 22°, c-l, cbys, wks 100 lb. | ... | 2.25 | ... | 2.25 | ... | 2.25 |
| tks, wks 100 lb. | ... | 1.65 | 1.60 | 1.65 | ... | 1.60 |
| CP, cbys lb. | .06½ | .08 | .06½ | .08 | .06½ | .07½ |
| N & W, 250 lb bbls lb. | .85 | .87 | .85 | .87 | .85 | .87 |
| Naphthenic, 240-280 s.v., drs lb. | .10 | nom. | nom. | .14 | .10 | .14 |
| Naphthionic, tech, 250 lb bbls lb. | .60 | .65 | .60 | .65 | .60 | .65 |
| Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c* | ... | 5.00 | ... | 5.00 | ... | 5.00 |
| 38°, c-l, cbys, wks 100 lb. *c* | ... | 5.50 | ... | 5.50 | ... | 5.50 |
| 40°, cbys, c-l, wks 100 lb. *c* | ... | 6.00 | ... | 6.00 | ... | 6.00 |
| 42°, c-l, cbys, wks 100 lb. *c* | ... | 6.50 | ... | 6.50 | ... | 6.50 |
| CP, cbys, delv lb. | .11½ | .13 | .11½ | .13 | .11½ | .12½ |
| Oxalic, 300 lb bbls, wks, or N Y lb. | .10¾ | .12 | .10¾ | .12 | .10¾ | .12 |
| Phosphoric, 85%, USP, cbys lb. | ... | .12 | .12 | .14 | .12 | .14 |
| 50%, acid, c-l, drs, wks lb. | ... | .12 | .06 | .12 | .06 | .08 |
| 75%, acid, c-l, drs, wks lb. | ... | .07½ | ... | .07½ | ... | .07½ |
| Picric, kgs, wks lb. | ... | .35 | .35 | .40 | .35 | .40 |
| Propionic, 98% wks, drs lb. | ... | .25 | | .25 | | .22 |
| 80% lb. | ... | .14 | .14 | .20 | .16 | .17½ |
| Pyrogallic, tech, lump, pwd, bbls lb. | ... | 1.20 | 1.05 | 1.20 | 1.45 | 1.63 |
| cryst, USP lb. | 1.70 | 2.25 | 1.55 | 2.25 | 1.55 | 2.10 |
| Ricinoleic, bbls lb. | .27 | .33 | .27 | .33 | ... | .35 |
| Salicylic, tech, 125 lb bbls, wks lb. | ... | .33 | ... | .33 | ... | .33 |
| USP, bbls lb. | .35 | .40 | .35 | .40 | .35 | .40 |
| Succinic, bbls lb. | ... | .75 | ... | .75 | ... | .75 |
| Sulfanilic, 250 lb bbls, wks lb. | ... | .17 | .17 | .18 | .17 | .18 |
| Sulfuric, 60°, tks, wks ton | ... | 13.00 | ... | 13.00 | ... | 13.00 |
| c-l, cbys, wks 100 lb. | ... | 1.25 | ... | 1.25 | ... | 1.25 |
| 66°, tks, wks ton | ... | 16.50 | ... | 16.50 | ... | 16.50 |
| c-l, cbys, wks 100 lb. | ... | 1:50 | ... | 1.50 | ... | 1.50 |
| CP, cbys, wks lb. | .06½ | .08 | .06½ | .08 | .06½ | .07½ |
| Fuming (Oleum) 20% tks, wks ton | ... | 18.50 | ... | 18.50 | ... | 18.50 |
| Tannic, tech, 300 lb bbls lb. | .54 | .56 | .44 | .56 | .40 | .47 |
| Tartaric, USP, gran, powd, 300 lb bbls lb. | .43¼ | .44¼ | .35¼ | .44¼ | .27½ | .31¼ |
| Tobias, 250 lb bbls lb. | .55 | .60 | .55 | .60 | .55 | .67 |
| Trichloroacetic bottles lb. | 2.00 | 2.50 | 2.00 | 2.50 | 2.00 | 2.50 |
| kgs lb. | .. | 1.75 | ... | 1.75 | ... | 1.75 |
| Tungstic, tech, bbls lb. | no prices | | no prices | | 1.70 | 1.80 |
| Albumen, light flake, 225 lb. bbls lb. | .55 | .62 | .55 | .62 | .52 | .68 |
| dark, bbls lb. | .13 | .18 | .13 | .18 | .13 | .18 |
| egg, edible lb. | .65 | .68 | .53 | .65 | .58 | .78 |
| **ALCOHOLS** | | | | | | |
| Alcohol, Amyl (from Pentane) tks, delv lb. | ... | .101 | ... | .101 | ... | .101 |
| c-l, drs, delv lb. | ... | .111 | ... | .111 | ... | .111 |
| lcl, drs, delv lb. | ... | .121 | ... | .121 | ... | .121 |
| Amyl, normal l-c-l drs Wyandotte, Mich. lb. | ... | .25 | ... | ... | ... | ... |
| secondary, tks, delv lb. | | | | | | |
| drs, c-l, delv E of Rockies lb. | ... | .09½ | ... | 09½ | ... | .09½ |
| tertiary, rfd, l-c-l, drs, lb. | ... | .09 | ... | ... | ... | ... |
| Benzyl, cans lb. | ... | .68 | .68 | 1.00 | .68 | 1.00 |
| Butyl, normal, tks, f.o.b. wks, frt all'd lb. *d* | ... | .08 | ... | .09 | .07 | .09 |
| c-l, drs, f.o.b. wks, frt all'd lb. *d* | ... | .09 | ... | .10 | .08 | .10 |
| Butyl, secondary, tks, delv lb. *d* | ... | .06½ | ... | .06½ | .05½ | .06½ |
| c-l, drs, delv lb. *d* | ... | .07½ | ... | .07½ | .06½ | .07½ |
| Capryl, drs, tech, wks lb. | . | .85 | ... | .85 | ... | .85 |
| Cinnamic, bottles lb. | 2.00 | 2.50 | 2.00 | 2.50 | 2.00 | 2.50 |
| Denatured, CD, 14, c-l drs, wks gal. *e* | .32½ | .37½ | .32½ | .36½ | .27½ | .36½ |
| tks, East, wks gal. | ... | .26½ | .25½ | .26½ | .21½ | .25½ |
| Western schedule, c-l, drs, wks gal. *e* | ... | .37½ | .34½ | .37½ | .34½ | .37 |
| Denatured, SD, No. 1, tks, | ... | .24½ | .23½ | .24½ | .25½ | .28½ |
| Diacetone, pure, c-lfi drs, delv lb. *f* | ... | .09½ | ... | .12 | .09 | .12 |
| tech, contract, drs, c-l, delv lb. | ... | .09 | ... | .11½ | .08½ | .11½ |

*c* Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

ZINC STEARATE
U. S. P.
ALUMINUM STEARATE
CALCIUM STEARATE
JOSEPH TURNER & CO.
RIDGEFIELD, NEW JERSEY
83 Exchange Place
Providence, R. I.
40th St. & Calumet Ave.
Chicago, Ill.
Chemicals for Industry

# *Prices Current*



| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Alcohols (continued): | | | | | | |
| Ethyl, 190 proof, molasses, tks gal. *g* | ... | 5.94½ | 5.93½ | 5.94½ | 4.46 | 4.48½ |
| c-l, drs gal. *g* | ... | 6.00½ | 5.92½ | 6.00½ | 4.49 | 4.54½ |
| c-l, bbls gal. *g* | ... | 6.01½ | 6.00½ | 6.01½ | 4.53 | 4.55½ |
| Furfuryl, tech, 500 lb drs lb. | ... | .35 | .25 | .35 | .25 | .35 |
| Hexyl, secondary tks, delv lb. | ... | .12 | ... | .12 | ... | .12 |
| c-l, drs, delv lb. | ... | .13 | ... | .13 | ... | .13 |
| Normal, drs, wks lb. | 3.25 | 3.50 | 3.25 | 3.50 | 3.25 | 3.50 |
| Isoamyl, prim, cans, wks lb. | ... | .32 | ... | .32 | ... | .32 |
| drs, lcl, delv lb. | ... | .27 | ... | .27 | ... | .27 |
| Isobutyl, ref'd, lcl, drs lb. | ... | .073 | ... | .073 | .073 | .09 |
| c-l, drs lb. | ... | .069 | ... | .069 | .068 | .08½ |
| tks lb. | ... | .059 | ... | .059 | ... | .07½ |
| Isopropyl, ref'd, 91%, c-l, drs, f.o.b. wks, frt all'd lb. | ... | .65 | ... | .65 | ... | .36 |
| Ref'd 98%, drs, f.o.b. wks, frt all'd gal. | ... | .65 | ... | .65 | ... | .41 |
| Tech 91%, drs, above terms gal. | ... | .33½ | ... | .33½ | ... | .33½ |
| tks, same terms gal. | ... | .28½ | ... | .28½ | ... | .28½ |
| Tech 98%, drs, above terms gal. | ... | .36 | .36 | .37½ | ... | .37½ |
| tks, above terms gal. | ... | .31 | .31 | .32½ | ... | .32½ |
| Spec. Solvent, tks, wks gal. | ... | .25½ | .23½ | .25½ | .19 | .23½ |
| Aldehyde ammonia, 100 gal drs lb. | .65 | .70 | .65 | .82 | .80 | .82 |
| Aldehyde Bisulfite, bbls, delv lb. | ... | .17 | ... | .17 | ... | .17 |
| Aldol, 95%, 55 and 110 gal, drs, delv lb. | .11 | .12 | .11 | .12 | .11 | .20 |
| Alphanaphthol, crude, 300 lb. bbls lb. | ... | .52 | ... | .52 | ... | .52 |
| Alphanaphthylamine, 350 lb bbls lb. | ... | .32 | .32 | .34 | .32 | .34 |
| Alum, ammonia, lump, c-l, bbls, wks 100 lb. | ... | 3.75 | ... | 3.75 | 3.40 | 3.75 |
| delv NY, Phila 100 lb. | ... | 3.75 | ... | 3.75 | 3.40 | 3.75 |
| Granular, c-l, bbls wks 100 lb. | ... | 3.50 | ... | 3.50 | 3.15 | 3.50 |
| Powd, c-l, bbls, wks 100 lb. | ... | 3.90 | ... | 3.90 | 3.55 | 3.90 |
| Chrome, bbls 100 lb. | no prices | | 6.50 | 6.75 | 6.50 | 6.75 |
| Potash, lump, c-l, bbls, wks 100 lb. | ... | 4.00 | ... | 4.00 | 3.65 | 4.00 |
| Granular, c-l, bbls, wks 100 lb. | ... | 3.75 | ... | 3.75 | 3.40 | 3.75 |
| Powd, c-l, bbls, wks 100 lb. | ... | 4.15 | ... | 4.15 | 3.80 | 4.15 |
| Soda, bbls, wks 100 lb. | ... | 3.25 | ... | 3.25 | ... | 3.25 |
| Aluminum metal, c-l, NY 100 lb. | ... | 18.00 | 18.00 | 20.00 | ... | 20.00 |
| Acetate, 20%, bbls lb. | .08 | .09 | .07½ | .09 | .07½ | .09 |
| Basic powd, bbls, delv lb. | .35 | .50 | .35 | .50 | .40 | .50 |
| 32% basic, bbls, delv lb. | .09½ | .12 | ... | ... | ... | ... |
| Insoluble basic powder, bbls, delv lb. | ... | .40 | ... | ... | ... | ... |
| Soluble normal pwdr lb. | ... | .22 | ... | ... | ... | ... |
| Soluble basic powder lb. | ... | .33 | ... | ... | ... | ... |
| Chloride anhyd 99% wks lb. | .08 | .12 | .08 | .12 | .06 | .12 |
| 93%, wks lb. | .05 | .08 | .05 | .08 | .05 | .08 |
| Crystals, c-l, drs, wks lb. | .06 | .06½ | .06 | .06½ | .06 | .06¼ |
| Solution, drs, wks lb. | .02¾ | .03¼ | .02¾ | .03¼ | .02¾ | .03¼ |
| Formate, 30% sol bbls, c-l, delv lb. | ... | .13 | ... | .13 | ... | .13 |
| Hydrate, 96%, light, 90 lb. bbls, delv lb. | .12½ | .13 | .12½ | .13½ | .11½ | .13 |
| heavy, bbls, wks lb. | .029 | .03½ | .029 | .03½ | .029 | .03½ |
| Oleate, drs lb. | .17½ | .20 | .16¾ | .20 | .16¾ | .18½ |
| Palmitate, bbls lb. | .20½ | .21½ | .20½ | .24½ | .23 | .24½ |
| Resinate, pp., bbls lb. | ... | .15 | ... | .15 | ... | .15 |
| Stearate, 100 lb bbls lb. | .18 | .19 | .19 | .20 | .16 | .22½ |
| Sulfate, com, c-l, bgs, wks 100 lb. | ... | 1.15 | ... | 1.15 | ... | 1.15 |
| c-l, bbls, wks 100 lb. | ... | 1.35 | ... | 1.35 | ... | 1.35 |
| Sulfate, iron-free, c-l, bags, wks 100 lb. | ... | 1.60 | 1.60 | 1.80 | ... | 1.45 |
| c-l, bbls, wks 100 lb. | ... | 1.80 | 1.65 | 1.80 | ... | 1.65 |
| Aminoazobenzene, 110 lb kgs lb. | ... | 1.15 | ... | 1.15 | ... | 1.15 |
| Ammonia anhyd fert com, tks lb. | ... | .05 | .04½ | .05 | .04½ | .05½ |
| Ammonia anhyd, 100 lb cyl lb. | ... | .16 | ... | .16 | ... | .16 |
| 50 lb cyl lb. | ... | .22 | ... | .22 | ... | .22 |
| 26°, 800 lb drs, delv lb. | .02¼ | .02½ | .02¼ | .02½ | .02¼ | .02½ |
| Aqua 26°, tks, NH cont. | ... | .05¼z | .04 | .05¼ | ... | .04z |
| Ammonium Acetate, kgs lb. | .27 | .33 | .27 | .33 | .26 | .33 |
| Bicarbonate, bbls, f.o.b. wks 100 lb. | ... | 5.56 | ... | 5.56 | 5.15 | 5.71 |
| Bifluoride, 300 lb bbls lb. | .14½ | .16½ | .14½ | .16½ | .14½ | .16½ |
| Carbonate, tech, 500 lb bbls lb. | .08¼ | .09¼ | .08¼ | .11 | .08 | .12 |
| Chloride, White, 100 lb bbls, wks 100 lb. | 4.45 | ... | 4.45 | 4.90 | 4.45 | 4.90 |
| Gray, 250 lb bbls, wks 100 lb. | 5.50 | 5.75 | 5.50 | 6.25 | 5.50 | 6.25 |
| Lump, 500 lb cks spot lb. | .10½ | .11 | .10½ | .11 | .10½ | .11 |
| Lactate, 500 lb bbls lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Laurate, bbls lb. | ... | .23 | ... | .23 | ... | .23 |
| Linoleate, 80% anhyd, bbls lb. | ... | .12 | ... | .12 | .11 | .15 |
| Naphthenate, bbls lb. | ... | .17 | ... | .17 | ... | .17 |
| Nitrate, tech, bbls lb. | ... | .0455 | ... | .0455 | .036 | .0455 |
| Oleate, drs lb. | ... | .14 | ... | .14 | .11 | .14 |
| Oxalate, neut, cryst, powd, bbls lb. | .19 | .25 | .19 | .25 | .19 | .20 |
| Perchlorate, kgs lb. | .17 | nom. | .17 | .19 | ... | .16 |
| Persulfate, 112 lb kgs lb. | .21 | .22 | .21 | .22 | .21 | .24 |
| Phosphate, diabasic tech, powd, 325 lb bbls lb. | .07¼ | .09¼ | .07¼ | .10 | .07½ | .10 |
| Ricinoleate, bbls lb. | ... | .15 | ... | .15 | ... | .15 |
| Stearate, anhyd, bbls lb. | ... | .24½ | ... | .24½ | .22 | .24½ |
| Paste, bbls lb. | ... | .06½ | ... | .06½ | .06½ | .08 |

*g* Grain alcohol 25c a gal. higher in each case. ** On a delv. basis.
z On a f.o.b. wks. basis.

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Ammonium (continued): | | | | | | |
| Sulfate, dom, f.o.b., bulk ton | ... | 28.00 | ... | 28.00 | 27.00 | 28.00 |
| Sulfocyanide, pure, kgs lb. | ... | .65 | .. | .65 | .55 | .65 |
| Amyl Acetate (from pentane) tks, delv lb. | ... | .095 | ... | .095 | .095 | .10 |
| c-l, drs, delv lb. | ... | .105 | ... | .105 | .105 | .11 |
| lcl, drs, delv lb. | ... | .115 | ... | .115 | .115 | .112 |
| tech drs, delv lb. | ... | .12½ | ... | .12½ | .10½ | .12½ |
| Secondary, tks, delv lb. | ... | .08½ | ... | .08½ | ... | .08½ |
| c-l, drs, delv lb. | ... | .09½ | ... | .09½ | ... | .09½ |
| tks, delv lb. | ... | .08½ | ... | .08½ | ... | .08½ |
| Chloride, norm, drs, wks lb. | .56 | .68 | .56 | .68 | .56 | .68 |
| mixed, drs, wks lb. | .0565 | .0665 | .0535 | .0665 | .0565 | .077 |
| tks, wks lb. | ... | .0465 | ... | .0465 | .0465 | .06 |
| Mercaptan, drs, wks lb. | ... | 1.10 | ... | 1.10 | ... | 1.10 |
| Oleate, lcl, wks, drs lb. | ... | .25 | ... | .25 | ... | .25 |
| Stearate, lcl, wks, drs lb. | ... | .26 | ... | .26 | ... | .26 |
| Amylene, drs, wks lb. | .102 | .11 | .102 | .11 | .102 | .11 |
| tks, wks lb. | ... | .09 | ... | .09 | ... | .09 |
| Aniline Oil, 960 lb drs and tks lb. | ... | .14½ | ... | .14½ | .14½ | .17½ |
| Annatto fine lb. | .34 | .39 | .34 | .39 | .34 | .39 |
| Anthracene, 80% lb. | ... | .55 | ... | .55 | .55 | .75 |
| Anthraquinone, sublimed, 125 lb bbls lb. | ... | .65 | ... | .65 | ... | .65 |
| Antimony metal slabs, ton lots lb. | ... | .14 | ... | .14 | .11¼ | .14 |
| Butter of, see Chloride | | | | | | |
| Chloride, soln, cbys lb. | ... | .17 | ... | .17 | ... | .17 |
| Needle, powd, bbls lb. | ... | .16 | .16 | .22 | .12 | .20 |
| Oxide, 500 lb bbls lb. | .13 | .14 | .13 | .15¾ | .10 | .15¾ |
| Salt, 63% to 65%, tins lb. | ... | .28 | .28 | nom. | .25¾ | .42 |
| Archil, conc, 600 lb bbls lb. | no prices | | no prices | | .21 | .27 |
| Double, 600 lb bbls lb. | no prices | | no prices | | .18 | .20 |
| Aroclors, wks lb. | .18 | .30 | .18 | .30 | .18 | .30 |
| Arrowroot, bbls lb. | .09½ | .10 | .09 | .10 | .08½ | .09 |
| Arsenic, Metal lb. | no prices | | .... | ... | .40 | .60 |
| Red, 224 lb cs kgs lb. | no prices | | .17½ | .18 | .18 | .19 |
| White, 112 lb kgs lb. | .03½ | .04¼ | .03 | .04¼ | .03 | .03¾ |

## B

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Barium Carbonate precip, 200 lb bgs, wks ton | 45.00 | 50.00 | 45.00 | 62.50 | 52.50 | 62.50 |
| Nat (witherite) 90% gr, c-l, wks, bgs ton | ... | 43.00 | 43.00 | 47.00 | 41.00 | 47.00 |
| Chlorate, 112 lb kgs, NY lb. | ... | .45 | .20 | .45 | .16½ | .25 |
| Chloride, 600 lb bbls, delv, zone 1 ton | 77.00 | 92.00 | 77.00 | 92.00 | 77.00 | 92.00 |
| Dioxide, 88%, 690 lb drs lb. | ... | .10 | .10 | .12 | .11 | .12 |
| Hydrate, 500 lb bbls lb. | .05½ | .07 | .05½ | .07 | .04½ | .05½ |
| Nitrate, bbls lb. | .08½ | .10½ | .09½ | .10½ | .06¾ | .10½ |
| Barytes, floated, 350 lb bbls c-l, wks ton | ... | 25.15 | ... | 25.15 | ... | 23.65 |
| Bauxite, bulk, mines ton | 7.00 | 10.00 | 7.00 | 10.00 | 7.00 | 10.00 |
| Bentonite, c-l, 325 mesh, bgs, wks ton | ... | 16.00 | ... | 16.00 | ... | 16.00 |
| 200 mesh ton | ... | 11.00 | ... | 11.00 | ... | 11.00 |
| Benzaldehyde, tech, 945 lb. drs, wks lb. | .45 | .50 | .55 | .60 | .60 | .62 |
| Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal. | ... | .14 | .14 | .16 | ... | .16 |
| 90% c-l, drs gal. | ... | .19 | .19 | .21 | ... | .21 |
| Ind pure, tks, frt all'd gal. | ... | .14 | .14 | .16 | ... | .16 |
| Benzidine Base, dry, 250 lb. bbls lb. | ... | .70 | ... | .70 | .70 | .72 |
| Benzoyl Chloride, 500 lb drs lb. | .23 | .28 | .23 | .28 | .40 | .45 |
| Benzyl Chloride, 95-97% rfd, drs lb. | .19 | .21 | .19 | .21 | .30 | .40 |
| Beta-Naphthol, 250 lb bbls, wks lb. | .23 | .24 | .23 | .24 | .23 | .24 |
| Naphthylamine, sublimed, 200 lb bbls lb. | 1.25 | 1.35 | 1.25 | 1.35 | 1.25 | 1.35 |
| Tech, 200 lb bbls lb. | .51 | .52 | .51 | .52 | .51 | .52 |
| Bismuth metal lb. | ... | 1.25 | ... | 1.25 | 1.05 | 1.25 |
| Chloride, boxes lb. | 3.20 | 3.25 | 3.20 | 3.25 | 3.20 | 3.25 |
| Hydroxide, boxes lb. | 3.35 | 3.46 | 3.35 | 3.46 | 3.15 | 3.40 |
| Oxychloride, boxes lb. | ... | 3.10 | ... | 3.10 | 2.95 | 3.10 |
| Subbenzoate, boxes lb. | ... | 3.36 | 3.25 | 3.36 | 3.25 | 3.30 |
| Subcarbonate, kgs ib. | 1.73 | 1.76 | 1.73 | 1.76 | 1.43 | 1.76 |
| Subnitrate, fibre, drs lb. | 1.48 | 1.51 | 1.48 | 1.51 | 1.23 | 1.51 |
| Trioxide, powd, boxes lb. | ... | 3.56 | 3.56 | 3.57 | .. | 3.57 |
| Blanc Fixe, 400 lb bbls, wks ton *h* | 35.00 | 42.50 | 50.00 | 80.00 | 40.00 | 80.00 |
| Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb. | 2.00 | 2.85 | ... | 2.85 | ... | 2.00 |
| lcl, drs, wks lb. | 2.25 | 3.35 | 2.25 | 3.35 | 2.25 | 3.60 |
| Blood, dried, f.o.b., NY unit | ... | 2.50 | 2.25 | 3.35 | 2.50 | 4.25 |
| Chicago, high grade unit | ... | 2.80 | 2.00 | 3.50 | 2.30 | 4.25 |
| Imported shipt unit | ... | 2.50 | 2.25 | 3.30 | 2.65 | 3.90 |
| Blues, Bronze Chinese ..... | | | | | | |
| Prussian Soluble lb. | ... | .33 | .33 | .37 | .33 | .37 |
| Milori, bbls lb. | .33 | .34 | .33 | .34 | .33 | .37 |
| Ultramarine,* dry, wks, bbls lb. | ... | .11 | ... | .11 | ... | .11 |
| Regular grade, group 1 lb. | ... | .16 | ... | .16 | ... | .16 |
| Special group 1 lb. | ... | .19 | ... | .19 | ... | .19 |
| Pulp, No. 1 lb. | .22 | .27 | .22 | .27 | ... | .27 |
| Bone, 4½ + 50% raw, Chicago ton | 30.00 | 33.00 | 30.00 | 33.00 | 27.00 | 35.00 |
| Bone Ash, 100 lb kgs lb. | .06 | .07 | .06 | .07 | .06 | .07 |
| Meal, 3% & 50%, imp ton | ... | 31.50 | 31.50 | 32.50 | 22.00 | 32.00 |
| Domestic, bgs, Chicago ton | ... | 32.00 | 29.00 | 32.00 | 24.00 | 32.00 |
| Borax, tech, gran, 80 ton lots, sacks, delv ton *i* | ... | 43.00 | ... | 43.00 | ... | 43.00 |
| bbls, delv ton *i* | ... | 53.00 | ... | 53.00 | ... | 53.00 |

*h* Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

| | Current | Market | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Borax (continued) ......... | | | | | | |
| Tech, powd, 80 ton lots, sacks ............ton i | ... | 48.00 | 47.00 | 48.00 | ... | 47.00 |
| bbls, delv ..........ton i | ... | 58.00 | 57.00 | 58.00 | ... | 57.00 |
| Bordeaux Mixture, drs ...lb. | .11 | .11½ | .11 | .11½ | .11 | .11½ |
| Bromine, cases ...........lb. | .25 | .30 | .25 | .43 | .30 | .43 |
| Bronze, Al, pwd, 300 lb drs lb. | ... | .57 | ... | .57 | .90½ | .92½ |
| Gold, blk ..............lb. | .60 | .65 | .60 | .65 | .45 | .65 |
| Butanes, com 16-32° group 3 tks ..............lb. | .02½ | .03 | .02¼ | .03¼ | .02¼ | .03¼ |
| Butyl, acetate, norm drs, frt all'd ..............lb. | ... | .09 | ... | .10 | .09 | .10 |
| tks, frt all'd .........lb | ... | .08 | ... | .09 | .08 | .09 |
| Secondary, tks, frt all'd lb. | ... | .06½ | ... | .06½ | .05½ | .06½ |
| drs, frt all'd ........lb. | .07½ | .08 | .07½ | .08 | .068 | .08 |
| Aldehyde, 50 gal drs, wks ..............lb. | .15½ | .17½ | .15½ | .17½ | .15½ | .17½ |
| Carbinol, norm (see Normal Amyl Alcohol) | | | | | | |
| Crotonate, norm, 55 and 110 gal drs, delv .....lb. | ... | .35 | ... | .35 | .35 | .75 |
| Lactate ..............lb. | ... | .23½ | .23½ | .24½ | .22½ | .24½ |
| Oleate, drs, frt all'd ...lb. | ... | .25 | ... | .25 | ... | .25 |
| Propionate, drs ........lb. | .16½ | .17 | .16½ | .17 | .16½ | .18½ |
| tks, delv ............lb. | ... | .15½ | ... | .15½ | .15½ | .17 |
| Stearate, 50 gal drs ....lb. | ... | .28½ | ... | .28½ | .26½ | .28½ |
| Tartrate, drs ..........lb. | .55 | .60 | .55 | .60 | .55 | .60 |
| Butyraldehyde, drs, lcl, wks lb. | ... | .35½ | ... | .35½ | ... | .35½ |
| **C** | | | | | | |
| Cadmium Metal .........lb. | .80 | .85 | .80 | .85 | .50 | .85 |
| Sulfide, orange, boxes ..lb. | ... | .75 | .75 | .85 | .75 | .90 |
| Calcium, Acetate, 150 lb bgs c-l, delv .........100 lb. | ... | 1.90 | ... | 1.90 | 1.65 | 1.90 |
| Arsenate, c-l, E of Rockies, dealers, drs .........lb. | .06 | .06½ | .06 | .07¼ | .06¾ | .07¼ |
| Carbide, drs ...........lb. | ... | .04¾ | .05 | .06 | .05 | .06 |
| Carbonate, tech, 100 lb bgs, c-l ...............lb. | ... | 1.00 | ... | 1.00 | ... | 1.00 |
| Chloride, flake, 375 lb drs, burlap bgs, c-l, delv..ton | ... | 20.50 | ... | 22.00 | ... | 22.00 |
| paper bags, c-l, delv..ton | 20.50 | 35.00 | 20.50 | 36.00 | 23.00 | 36.00 |
| Solid, 650 lb drs, c-l, delv ..............ton | 19.00 | 33.00 | 19.00 | 35.00 | ... | 20.00 |
| Ferrocyanide, 350 lb bbls wks ...............lb. | ... | .20 | ... | .20 | ... | .20 |
| Gluconate, Pharm, 125 lb bbls ...............lb. | .50 | .57 | .50 | .57 | .50 | .57 |
| Levulinate, less than 25 bbl lots, wks ........lb. | ... | 3.00 | ... | 3.00 | ... | 3.00 |
| Nitrate, 100 lb bags ...ton | no prices | | 28.00 | 29.00 | ... | 28.00 |
| Palmitate, bbls ........lb. | .22 | .24 | .22 | .24 | .22 | .23 |
| Phosphate, tribasic, tech, 450 lb bbls ..........lb. | .0635 | .0705 | .0635 | .07½ | .06½ | .07½ |
| Resinate, precip, bbls ..lb. | .13 | .14 | .13 | .14 | .13 | .14 |
| Stearate, 100 lb bbls ...lb. | .20½ | .22½ | .20½ | .22½ | .19 | .21 |
| Camphor, slabs .........lb. | .82 | .83 | .82 | .84 | .46 | .77 |
| Powder ..............lb. | .82 | .83 | .82 | .84 | .45 | .47 |
| Carbon Bisulfide, 500 lb drs lb. | .05 | .05¾ | .05 | .05¾ | .05 | .05¾ |
| Black, c-l, bgs, delv. price varying with zone† ..lb. | ... | .02¾ | .02¾ | .03¾ | .02¾ | .03¾ |
| lcl, bgs, f.o.b. whse ..lb. | ... | .06525 | ... | .06525 | ... | .06¼ |
| cartons, f.o.b. whse .....lb. | ... | .06525 | ... | .06525 | ... | .06¼ |
| cases, f.o.b. whse ......lb. | ... | .07025 | ... | .07025 | ... | .07 |
| Decolorizing, drs, c-l ..lb. | .08 | .15 | .08 | .15 | .08 | .15 |
| Dioxide, Liq 20-25 lb cyl lb. | .06 | .08 | .06 | .08 | .06 | .08 |
| Tetrachloride, 55 or 110 gal drs, c-l, delv ....lb. | ... | .66½ | ... | .66½ | .05 | .05½ |
| Casein, Standard, Dom, grd lb. | .13 | .14 | .10 | .14½ | .07 | .23 |
| 80-100 mesh, c-l bgs ...lb. | .13½ | .14½ | .11 | .15 | .07½ | .23½ |
| Castor Pomace, 5½ $NH_3$, c-l, bgs, wks ............ton | 15.00 | ... | 15.00 | 17.50 | 16.50 | 18.50 |
| Imported, ship, bgs ....ton | no prices | | ... | 20.00 | 18.00 | 18.00 |
| Celluloid, Scraps, ivory cs lb. | .12 | .15 | .12 | .15 | .12 | .15 |
| Transparent, cs ........lb. | ... | .20 | ... | .20 | ... | .20 |
| Cellulose, Acetate, 50 lb kgs ......................lb. | ... | .30 | .30 | .34 | .35 | .36 |
| Chalk, dropped, 175 lb bbls lb. | ... | .02¾ | .02¾ | .03¼ | .02¾ | .03¼ |
| Precip, heavy, 560 lb cks lb. | ... | .03¼ | .02¾ | .03¼ | .02¾ | .03¼ |
| Light, 250 lb cks ......lb. | ... | .03¼ | .03¼ | .04 | .03¼ | .04 |
| Charcoal, Hardwood, lump, blk, wks ............bu. | ... | .15 | ... | .15 | ... | .15 |
| Softwood, bgs, delv* ..ton | 25.00 | 36.00 | 25.00 | 36.00 | 23.00 | 36.00 |
| Willow, powd, 100 lb bbls, wks ...............lb. | .06 | .07 | .06 | .07 | .06 | .07 |
| Chestnut, clarified tks, wks lb. | ... | .01¾ | ... | .01¾ | ... | .01¾ |
| 25%, bbls, wks ........lb. | ... | .02½ | ... | .02½ | ... | .02 |
| China Clay, c-l, blk mines ton | ... | 7.60 | 7.60 | 9.50 | 7.00 | 7.60 |
| Imported, lump, blk ...ton | no prices | | ... | 26.00 | 22.00 | 26.00 |
| Chlorine, cyls, lcl, wks, contract ...............lb. | ... | .07¼ | .07½ | .08½ | .07½ | .08½ |
| cyls, c-l, contract ...lb j | ... | .05¼ | ... | .05¼ | .05¼ | .05½ |
| Liq. tk, wks, contract 100 lb. | ... | 1.75 | ... | 1.75 | 1.75 | 2.00 |
| Multi, c-l, cyls, wks, cont ...............lb. | ... | .019 | ... | .019 | 1.90 | 2.15 |
| Chloroacetophenone, tins, wks ...............lb. | 3.00 | 3.50 | 3.00 | 3.50 | 3.00 | 3.50 |
| Chlorobenzene, Mono, 100 lb. drs, lcl, wks ........lb. | .06 | .08 | .06 | .08 | .06 | .07½ |
| Chloroform, tech, 1000 lb drs ...............lb. | ... | .20 | .20 | .21 | .20 | .21 |
| USP, 25 lb tins .......lb. | ... | .30 | .30 | .31 | .30 | .31 |
| Chloropicrin, comml cyls ..lb. | ... | .80 | ... | .80 | ... | .80 |
| Chrome, Green, CP ......lb. | .21 | .25 | .21 | .25 | .21 | .25 |
| Yellow ..............lb. | .13½ | .14½ | .13½ | .14½ | .13½ | .15½ |
| Chromium Acetate, 8% Chrome, bbls ........lb. | ... | .05¾ | ... | .05¾ | .05 | .08 |
| Fluoride, powd, 400 lb bbl ...............lb. | .27 | .28 | .27 | .28 | .27 | .28 |

*j* A delivered price; * Depends upon point of delivery; † New bulk price, tank cars ¼c per lb. less than bags in each zone.

| | Current | Market | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Coal tar, bbls ............bbl. | 7.50 | 7.75 | 7.50 | 8.00 | 7.50 | 8.00 |
| Cobalt Acetate, bbls ......lb. | ... | .80½ | ... | .80½ | .65 | .71 |
| Carbonate tech, bbls ...lb. | ... | 1.58 | 1.38 | 1.60 | 1.25 | 1.63 |
| Hydrate, bbls ..........lb. | ... | 1.98 | ... | 1.78 | ... | 1.78 |
| Linoleate, solid, bbls ...lb. | ... | .33 | ... | .33 | ... | .33 |
| paste, 6%, drs ......lb. | ... | .31 | ... | .31 | ... | .31 |
| Oxide, black, bgs ......lb. | ... | 1.84 | ... | 1.84 | 1.67 | 1.84 |
| Resinate, fused, bbls ...lb. | ... | .13½ | ... | .13½ | ... | .13½ |
| Precipitated, bbls .....lb. | ... | .34 | ... | .34 | ... | .34 |
| Cochineal, gray or bk bgs lb. | .37 | .38 | .37 | .38 | .35 | .38 |
| Teneriffe silver, bgs ....lb. | .38 | .39 | .38 | .39 | .36 | .39 |
| Copper, metal, electrol 100 lb. | ... | 12.00 | 11.00 | 12.00 | .10 | 12.50 |
| Acetate, normal, bbls, wks ...............lb. | .22 | .24 | .22 | .24 | .21 | .24 |
| Carbonate, 52-54% 400 lb bbls ...............lb. | ... | .1650 | .1570 | .169 | .14½ | .169 |
| Chloride, 250 lb bbls ...lb. | ... | .16 | .16 | .18 | .12½ | .18 |
| Cyanide, 100 lb drs ....lb. | ... | .34 | ... | .34 | ... | .34 |
| Oleate, precip, bbls ....lb. | ... | .20 | ... | .20 | ... | .20 |
| Oxide, black, bbls, wks lb. | ... | .18 | .18 | .18¾ | .15 | .18¾ |
| red 100 lb bbls ......lb. | ... | .19½ | .19½ | .20 | .15¾ | .20 |
| Sub-acetate verdigris, 400 lb bbls ..........lb. | .18 | .19 | .18 | .19 | .18 | .19 |
| Sulfate, bbls, c-l, wks, 100 lb. | ... | 4.75 | 4.45 | 4.75 | 4.10 | 4.75 |
| Copperas crys and sugar bulk c-l, wks ............ton | 18.00 | 20.00 | 14.00 | 20.00 | 14.00 | 16.00 |
| Corn Sugar, tanners, bbls 100 lb. | ... | 3.39 | 2.99 | 3.39 | 2.89 | 3.19 |
| Corn Syrup, 42°, bbls 100 lb. | ... | 3.42 | 3.02 | 3.47 | 2.92 | 3.17 |
| 43°, bbls ........100 lb. | ... | 3.47 | 3.07 | 3.52 | 2.97 | 3.22 |
| Cotton, Soluble, wet 100 lb. bbls ...............lb. | .40 | .42 | .40 | .42 | .40 | .42 |
| Cream Tartar, powd & gran 300 lb bbls ..........lb. | ... | .36¾ | .28¼ | .36¾ | .24¼ | .25¾ |
| Creosote, USP 42 lb cbys lb. | .45 | .47 | .45 | .47 | .45 | .47 |
| Oil, Grade 1 tks .....gal. | .13½ | .14 | .13½ | .14 | .13½ | .14 |
| Grade 2 ...........gal. | .122 | .132 | .122 | .132 | .122 | .132 |
| Cresol, USP, drs ........lb. | .09¾ | .10¼ | .09¾ | .10¼ | .09½ | .10½ |
| Crotonaldehyde, 97%, 55 and 110 gal drs, wks .....lb. | .11 | .12 | .11 | .12 | .11 | .22* |
| Cutch, Philippine, 100 lb. bale lb. | ... | .04½ | .04 | .04½ | .04 | .04½ |
| Cyanamid, pulv, bags, c-l, frt all'd, nitrogen basis, unit | ... | 1.40 | ... | 1.40 | ... | 1.27½ |
| **D** | | | | | | |
| Derris root 5% rotenone, bbls ...............lb. | .21 | .23 | .21 | .30 | .24 | .30 |
| Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb. | ... | 3.80 | 3.40 | 3.80 | 3.30 | 3.75 |
| British Gum, bgs ...100 lb. | ... | 4.05 | 3.65 | 4.05 | 3.55 | 3.95 |
| Potato, Yellow, 220 lb bgs lb. | ... | .07¾ | ... | .07¾ | .07 | .08¾ |
| White, 220 lb bgs, lcl lb. | .08½ | .09 | .08½ | .09 | .08 | .09 |
| Tapioca, 200 bgs, lcl ...lb. | ... | .0715 | ... | .0715 | ... | .0715 |
| White, 140 lb. bgs ..100 lb. | ... | 3.75 | 3.35 | 3.75 | 3.25 | 3.70 |
| Diamylamine, c-l, drs, wks lb. | ... | .47 | ... | .47 | ... | .47 |
| lcl drs, wks .........lb. | ... | .48 | ... | .50 | ... | .50 |
| tks, wks ............lb. | ... | .45 | ... | .45 | ... | .45 |
| Diamylene, drs, wks .....lb. | .095 | .102 | .095 | .102 | .095 | .102 |
| tks, wks ...........lb. | ... | .08½ | ... | .08½ | ... | .08½ |
| Diamylether, wks, drs ....lb. | .085 | .092 | .085 | .092 | .085 | .092 |
| tks, wks ...........lb. | ... | .075 | ... | .075 | ... | .075 |
| Oxalate, lcl, drs, wks...lb. | ... | .30 | ... | .30 | ... | .30 |
| Diamylphthalate, drs, wks lb. | .21 | .21½ | .21 | .21½ | .19 | .21 |
| Diamyl Sulfide, drs, wks lb. | ... | 1.10 | ... | 1.10 | ... | 1.10 |
| Diatomaceous Earth, see Kieselguhr. | | | | | | |
| Dibutoxy Ethyl Phthalate, drs, wks ............lb. | ... | .35 | ... | .35 | ... | .35 |
| Dibutylamine, lcl, drs, wks lb. | .51 | .53 | .51 | .53 | .53 | .55 |
| c-l drs, wks .........lb. | ... | .50 | ... | .50 | ... | ... |
| tks, wks ............lb. | ... | .48 | ... | .48 | ... | ... |
| Dibutyl Ether, drs, wks, lcl lb. | .24½ | .25 | .24½ | .25 | .24½ | .25 |
| Dibutylphthalate, drs, wks, frt all'd ...........lb. | .19 | .19½ | .19 | .19½ | .19 | .19½ |
| Dibutyltartrate, 50 gal drs lb. | ... | .50 | ... | .50 | .45 | .54 |
| Dichlorethylene, drs .....lb. | ... | .25 | ... | .25 | ... | .25 |
| Dichloroethylether, 50 gal drs, wks ............lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| tks, wks .............lb. | ... | .14 | ... | .14 | ... | .14 |
| Dichloromethane, drs, wks lb. | ... | .23 | ... | .23 | ... | .23 |
| Dichloropentanes, drs, wks lb. | ... | .025 | ... | .025 | no prices | |
| tks, wks ..............lb. | ... | .0221 | ... | .0221 | no prices | |
| Diethanolamine, tks, wks..lb. | ... | .22½ | ... | .22½ | .22½ | .23 |
| Diethylamine, 400 lb drs, lcl, f.o.b., wks .........lb. | ... | .70 | ... | .70 | .70 | 3.00 |
| Diethylaniline, 850 lb drs lb. | ... | .40 | .40 | .52 | .40 | .52 |
| Diethyl Carbinol, drs .....lb. | .60 | .75 | .60 | .75 | .60 | .75 |
| Diethylcarbonate, com drs lb. | ... | .25 | ... | .25 | .31¾ | .35 |
| Diethylorthotoluidin, drs ..lb. | .64 | .67 | .64 | .67 | .64 | .67 |
| Diethylphthalate, 1000 lb drs lb. | .19 | .19½ | .19 | .19½ | .19 | .19½ |
| Diethylsulfate, tech, drs, wks, lcl .............lb. | .13 | .14 | .13 | .14 | .13 | .14 |
| Diethyleneglycol, drs .....lb. | .14½ | .15½ | .14½ | .15½ | .14½ | .17 |
| Mono ethyl ethers, drs ..lb. | .14½ | .15½ | .14½ | .16 | .15 | .16 |
| tks, wks ............lb. | ... | .13½ | ... | .13½ | .13½ | .14 |
| Mono butyl ether, drs ..lb. | .22½ | .24½ | .22½ | .24½ | .23 | .24 |
| tks, wks ............lb. | ... | .22 | ... | .22 | ... | .22 |
| Diethylene oxide, 50 gal drs, wks ...............lb. | .20 | .24 | .20 | .24 | .20 | .24 |
| Diglycol Laurate, bbls ....lb. | ... | .16 | .16 | .21 | .15 | .23 |
| Oleate, bbls ..........lb. | ... | .17 | .13 | .17 | .13 | .20 |
| Stearate, bbls .........lb. | ... | .22 | .22 | .26 | .20 | .28 |
| Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ........lb. | 1.00 | 1.05 | 1.00 | 1.05 | ... | 1.00 |
| Dimethylaniline, 240 lb drs lb. | .23 | .24 | .23 | .24 | .23 | .24 |
| Dimethyl Ethyl Carbinol, drs lb. | .60 | .75 | .60 | .75 | .60 | .75 |
| Dimethyl phthalate, drs, wks, frt all'd ........lb. | ... | .18½ | ... | .18½ | ... | .19 |
| Dimethylsulfate, 100 lb drs lb. | .45 | .50 | .45 | .50 | .45 | .50 |

*k* Higher price is for purified material; * These prices were on a delivered basis.

---

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Dinitrobenzene, 400 lb bbls lb. *k* | ... | .18 | .18 | .19 | .16 | .19 |
| Dinitrochlorobenzene, 400 lb bbls ... lb. | ... | .14 | ... | .14 | .13½ | .14 |
| Dinitronaphthalene, 350 lb bbls ... lb. | .35 | .38 | .35 | .38 | .35 | .38 |
| Dinitrophenol, 350 lb bbls lb. | ... | .22 | .22 | .23 | .22 | .24 |
| Dinitrotoluene, 300 lb bbls lb. | . | .15½ | | .15½ | . . | .15½ |
| Diphenyl, bbls ... lb. | .15 | .20 | .15 | .20 | .15 | .25 |
| Diphenylamine ... lb. | . | .25 | .25 | .32 | .32 | .32 |
| Diphenylguanidine, 100 lb drs ... lb. | .35 | .37 | .35 | .37 | .31 | .37 |
| Dip Oil, see Tar Acid Oil. | | | | | | |
| Divi Divi pods, bgs shipmt ton | | nom. | . | nom. | . . | nom. |
| Extract ... lb. | .05¼ | .06¼ | .05¼ | .06¼ | .05¼ | .06¼ |
| Drymet (see sodium metasilicate anhydrous). | | | | | | |
| **E** | | | | | | |
| Egg Yolk, dom., 200 lb. cases lb. | .59 | .61 | .57 | .62 | .59 | .69 |
| Epsom Salt, tech, 300 lb bbls c-l, NY ... 100 lb. | ... | 1.90 | 1.90 | 2.10 | 1.90 | 2.10 |
| USP, c-l, bbls ... 100 lb. | ... | 2.10 | ... | 2.10 | ... | 2.10 |
| Ether, USP anaesthesia 55 lb drs ... lb. | ... | .26 | ... | .26 | .22 | .23 |
| Isopropyl 50 gal drs ... lb. | .07 | .08 | .07 | .08 | .07 | .08 |
| tks, frt all'd ... lb. | ... | .06 | ... | .06 | ... | .06 |
| Nitrous conc bottles ... lb. | | .68 | . . | .68 | ... | .68 |
| Synthetic, wks, drs ... lb. | .08 | .09 | .08 | .09 | .08 | .09 |
| Ethyl Acetate, 85% Ester tks, frt all'd ... lb. | ... | .06½ | .06 | .06½ | .051 | .061 |
| drs, frt all'd ... lb. | ... | .07½ | .07 | .08½ | .061 | .08 |
| 99%, tks, frt all'd ... lb. | ... | .06¾ | .06¼ | .08 | .0585 | .0685 |
| drs, frt all'd ... lb. | ... | .07¾ | .07¼ | .08¾ | .0685 | .0785 |
| Acetoacetate, 110 gal drs lb. | . . | .27½ | ... | .27½ | ... | .27½ |
| Benzylaniline, 300 lb drs lb. | .86 | .88 | .86 | .88 | .86 | .88 |
| Bromide, tech drs ... lb. | .50 | .55 | .50 | .55 | .50 | .55 |
| Cellulose, drs, wks, frt all'd ... lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Chloride, 200 lb drs ... lb. | .18 | .20 | .18 | .20 | .22 | .24 |
| Chlorocarbonate, cbys ... lb. | ... | .30 | ... | .30 | ... | .30 |
| Crotonate, drs ... lb. | . . | 35 | ... | .35 | .35 | .75 |
| Formate, drs, frt all'd ... lb. | .25 | .26 | .23 | .24 | .27 | .28 |
| Lactate, drs, wks ... lb. | ... | .33½ | ... | .33½ | ... | .33½ |
| Oxalate, drs, wks ... lb. | ... | .25 | ... | .25 | .30 | .34 |
| Oxybutyrate, 50 gal drs, wks ... lb. | 1.00 | nom. | .30 | 1.00 | .30 | .30½ |
| Silicate, drs, wks ... lb. | ... | .77 | ... | .77 | ... | .77 |
| Ethylene Dibromide, 60 lb drs ... lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| Chlorhydrin, 40%, 10 gal cbys chloro, cont ... lb. | .75 | .85 | .75 | .85 | .75 | .85 |
| Anhydrous ... lb. | ... | .75 | ... | .75 | . | .75 |
| Dichloride, 50 gal drs, wks lb. | .0595 | .0694 | .0595 | .0694 | .0545 | .0994 |
| Glycol, 50 gal drs, wks ... lb. | .14½ | .18½ | .14½ | .18½ | .14½ | .21 |
| tks, wks ... lb. | ... | .13½ | ... | .13½ | .13½ | .16 |
| Mono Butyl Ether, drs, wks ... lb. | .16½ | .17½ | .16½ | .21 | .16½ | .22 |
| tks, wks ... lb. | ... | .15½ | ... | .15½ | .15½ | .19 |
| Mono Ethyl Ether, drs wks ... lb. | .14½ | .15½ | .14½ | .15½ | .14½ | .17 |
| tks, wks ... lb. | ... | .13½ | ... | .13½ | .13½ | .15 |
| Mono Ethyl Ether Acetate, drs, wks ... lb. | .11½ | .12½ | .11½ | .13 | .11½ | .14 |
| tks, wks ... lb. | ... | .10½ | . . | .10½ | .10½ | .13 |
| Mono Methyl Ether, drs wks ... lb. | .15½ | .16½ | .15½ | .17 | .16 | .22 |
| tks, wks ... lb. | . | .14½ | . . | .14½ | .14½ | .17 |
| Oxide, cyl ... lb. | .50 | .55 | .50 | .55 | .50 | .55 |
| Ethylideneaniline ... lb. | 45 | .47½ | .45 | .47½ | .45 | .47½ |
| **F** | | | | | | |
| Feldspar, blk pottery ... ton | 17.00 | 19.00 | 17.00 | 19.00 | 17.00 | 19.00 |
| Powd, blk wks ... ton | 14.00 | 17.50 | 14.00 | 17.50 | 14.00 | 14.50 |
| Ferric Chloride, tech, crys, 475 lb bbls ... lb. | .05 | .07½ | .05 | .07½ | .05 | .07½ |
| sol, 42° cbys ... lb. | .06½ | .07 | .06¼ | .07 | .06¼ | .06½ |
| Fish Scrap, dried, unground wks ... unit *l* | ... | 3.25 | 3.10 | 4.25 | 3.00 | 4.25 |
| Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ... unit *m* | ... | 2.50 | 2.25 | 3.50 | 2.35 | 3.00 |
| Fluorspar, 98% bgs ... ton | ... | 29.00 | 29.00 | 32.00 | 30.00 | 33.00 |
| Formaldehyde, USP, 400 lb bbls, wks ... lb. | .055 | .06 | .05¾ | .06¼ | .05¾ | .06¼ |
| Fossil Flour ... lb. | .02½ | .04 | .02½ | .04 | .02½ | .04 |
| Fullers Earth, blk, mines ton | ... | 15.00 | ... | 15.00 | 10.00 | 11.00 |
| Imp powd, c-l, bgs ... ton | no prices | | . . | 25.00 | 23.00 | 30.00 |
| Furfural (tech) drs, wks lb. | .10 | .15 | .10 | .15 | .10 | .15 |
| Furfuramide (tech) 100 lb drs ... lb. | | .30 | . . | .30 | . | .30 |
| Fusel Oil, 10% impurities lb. | .16 | .17¼ | .16 | .17¼ | .12½ | .17¼ |
| Fustic, crystals, 100 lb boxes ... lb. | .24 | .25 | .24 | .28 | .22 | .28 |
| Liquid 50°, 600 lb bbls lb. | .10½ | .14 | .10½ | .14 | .09½ | .14 |
| Solid, 50 lb boxes ... lb. | .19 | .21 | .19 | .21 | .17½ | .21 |
| **G** | | | | | | |
| G Salt paste, 360 lb bbls ... lb. | . . | .45 | .45 | .47 | .45 | .47 |
| Gambier, com 200 lb bgs ... lb. | .06½ | .07 | .06½ | .07 | .06¾ | .07¾ |
| Singapore cubes, 150 lb bgs ... 100 lb. | .08¼ | .08¾ | .08¼ | .10 | .08 | .10 |
| Gelatine, tech, 100 lb cs ... lb. | .42 | .43 | .42 | .43 | .42 | .50 |
| Glauber's Salt, tech, c-l, bgs, wks* ... 100 lb. | .95 | 1.18 | .95 | 1.18 | .95 | 1.18 |
| Anhydrous, see Sodium Sulfate | | | | | | |

*l* + 10; *m* + 50; * Bbls. are 20c higher.

# Current

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Glue, bone, com grades, c-l bgs . . . lb. | .13½ | .15 | .13½ | .15½ | .13½ | .15½ |
| Better grades, c-l, bgs lb. | .15 | .23 | .15 | .23 | .11½ | .15½ |
| Glycerin, CP, 550 lb drs lb. | . . . | .12½ | . . . | .12½ | . . . | .12½ |
| Dynamite, 100 lb drs . . . lb. | | nom. | | nom. | . . . | .09 |
| Saponification, drs . . . lb. | .09½ | .10½ | .09½ | .13 | .08½ | .10 |
| Soap Lye, drs . . . lb. | .07⅛ | .07⅜ | .07⅛ | .08¼ | .07½ | .07⅞ |
| Glyceryl Bori-Borate, bbls lb. | . . . | .40 | . . . | .40 | . . . | .40 |
| Monoricinoleate, bbls . . . lb. | . . . | .27 | . . . | .27 | . . . | .27 |
| Monostearate, bbls . . . lb. | . . . | .30 | . . . | .30 | . . . | .30 |
| Oleate, bbls . . . lb. | . . . | .22 | . . . | .22 | . . . | .22 |
| Phthalate . . . lb. | . . . | .38 | .37 | .38 | . . . | .37 |
| Glyceryl Stearate, bbls . . . lb. | . . . | .18 | . . . | .18 | .24 | .27½ |
| Glycol Bori-Borate, bbls . . lb. | . . . | .22 | . . . | .22 | .22 | .23 |
| Phthalate, drs . . . lb. | . . . | .38 | . . . | .38 | .38 | .40 |
| Stearate, drs . . . lb. | . . . | .26 | . . . | .26 | . . . | .26 |

## GUMS

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Gum Aloes, Barbadoes . . . lb. | .80 | .85 | .80 | .90 | .85 | .90 |
| Arabic, amber sorts . . . lb. | .14 | .15 | .08½ | .15 | .09 | .24 |
| White sorts, No. 1, bgs lb. | .35 | .36 | .28 | .36 | .23 | .35 |
| No. 2, bgs . . . lb. | no prices | | .27 | .34 | .21 | .34 |
| Powd, bbls . . . lb. | .18 | .20 | .12½ | .20 | .12½ | .27 |
| Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY . . . lb. | .04½ | .05½ | .02½ | .10½ | .02½ | .10½ |
| California, f.o.b. NY, drs ton | 29.00 | 36.50 | 29.00 | 36.50 | 29.00 | 55.00 |
| Egyptian, 200 lb cases, f.o.b. NY . . . lb. | .12 | .15 | .12 | .15 | .12 | .15 |
| Benzoin Sumatra, USP, 120 lb cases . . . lb. | .19 | .20 | .17 | .24 | .17 | .34 |
| Copal, Congo, 112 lb bgs, clean, opaque . . . lb. | . . . | .49½ | . . . | .49½ | .18¼ | .29½ |
| Dark amber . . . lb. | . . . | .12⅜ | .11⅜ | .12⅜ | .07⅛ | .11⅜ |
| Light amber . . . lb. | . . . | .17 | . . . | .17 | .11¼ | .17 |
| Copal, East India, 180 lb bgs | | | | | | |
| Macassar pale bold . . . lb. | . . . | .12¾ | .12¾ | .15⅝ | .11⅜ | .15¼ |
| Chips . . . lb. | . . . | .06¾ | .06¾ | .09 | .05⅜ | .08½ |
| Dust . . . lb. | . . . | .05¼ | .04¾ | .06¾ | .03¼ | .07⅛ |
| Nubs . . . lb. | . . . | .10½ | .10½ | .14⅜ | .09½ | .13¾ |
| Singapore, Bold . . . lb. | . . . | .15¾ | .14⅝ | .17½ | .14 | .18¼ |
| Chips . . . lb. | . . . | .08½ | .08½ | .09⅛ | .05⅝ | .10¼ |
| Dust . . . lb. | . . . | .05¼ | .04¾ | .06¾ | .03¼ | .07⅛ |
| Nubs . . . lb. | . . . | .11 | .11 | .13½ | .09⅝ | .14⅜ |
| Copal Manila, 180-190 lb | . . . | .13⅞ | .13¾ | .16¾ | .09¾ | .14½ |
| Loba B . . . lb. | . . . | .11¾ | .11¾ | .16⅛ | .09 | .14⅛ |
| Loba C . . . lb. | . . . | .11¼ | .11¼ | .14½ | .07⅞ | .12½ |
| DBB . . . lb. | . . . | .10 | .06⅞ | .12⅛ | .05⅛ | .08½ |
| MA sorts . . . lb. | . . . | .07¾ | .07¾ | .13¾ | .05⅞ | .11 |
| Copal Pontianak, 224 lb cases, bold genuine . . lb. | . . . | .15⅜ | .15⅛ | .18½ | .15¼ | .18½ |
| Chips . . . lb. | . . . | .10 | .08⅜ | .10½ | .07⅛ | .11½ |
| Mixed . . . lb. | . . . | .14⅜ | .14⅛ | .16⅝ | .13⅜ | .16⅝ |
| Nubs . . . lb. | . . . | .12¾ | .10¾ | .13½ | .10½ | .14⅜ |
| Split . . . lb. | . . . | .13¾ | .13½ | .16⅛ | .12 | .16⅛ |
| Damar Batavia, 136 lb cases | | | | | | |
| A . . . lb. | . . . | .21⅝ | .21⅝ | .22¾ | .20 | .23¾ |
| B . . . lb. | . . . | .20¼ | .20⅛ | .21⅛ | .18½ | .21⅛ |
| C . . . lb. | . . . | .14⅝ | .15⅝ | .15¼ | .13½ | .15⅝ |
| D . . . lb. | . . . | .13¼ | .13¼ | .13¾ | .12¼ | .14¼ |
| A/D . . . lb. | . . . | .15¼ | .13⅞ | .14½ | .12¾ | .15¼ |
| A/E . . . lb. | . . . | .12⅞ | .12⅞ | .13⅜ | .11⅜ | .13¾ |
| E . . . lb. | . . . | .10 | .10 | .10⅜ | .07⅜ | .10 |
| F . . . lb. | . . . | .08 | .08 | .08¾ | .07¼ | .08¾ |
| Singapore, No. 1 . . . lb. | . . . | .16⅝ | .16⅝ | .19⅝ | .13¼ | .19½ |
| No. 2 . . . lb. | . . . | .12¼ | .12¼ | .15¾ | .10½ | .16⅜ |
| No. 3 . . . lb. | . . . | .07⅛ | .07⅛ | .09 | .05¼ | .09⅛ |
| Chips . . . lb. | . . . | .11 | .11 | .12½ | .09¼ | .12½ |
| Dust . . . lb. | . . . | .07⅛ | .07⅛ | .09 | .05¼ | .09⅛ |
| Seeds . . . lb. | . . . | .09⅞ | .09⅞ | .10½ | .07⅜ | .10½ |
| Elemi, cns, c-l . . . lb. | . . . | .08½ | .10⅛ | .11⅝ | .08⅛ | .12⅝ |
| Ester . . . lb. | .06¼ | .06¾ | .06¼ | .06¾ | .05 | .07 |
| Gamboge, pipe, cases . . . lb. | .75 | .80 | .70 | .75 | .55 | .80 |
| Powd, bbls . . . lb. | .80 | .85 | .75 | .80 | .60 | .85 |
| Ghatti, sol, bgs . . . lb. | .11 | .15 | .11 | .15 | .11 | .15 |
| Karaya, bbls, bxs, drs . . . lb. | .14 | .33 | .14 | .33 | .14 | .33 |
| Kauri, NY | | | | | | |
| Brown XXX, cases . . . lb. | . . . | .60 | . . . | 60 | .60 | .60½ |
| BX . . . lb. | . . . | .38 | . . . | .38 | . . . | .38 |
| B1 . . . lb. | . . . | .28 | . . . | .28 | . . . | .28 |
| B2 . . . lb. | . . . | .24 | . . . | .24 | . . . | .24 |
| B3 . . . lb. | . . . | .18½ | . . . | .18½ | . . . | .18½ |
| Pale XXX . . . lb. | . . . | .61 | . . . | .61 | . . . | .61 |
| No. 1 . . . lb. | . . . | .41 | . . . | .41 | . . . | .41 |
| No. 2 . . . lb. | . . . | .24 | . . . | .24 | . . . | .24 |
| No. 3 . . . lb. | . . . | .17¼ | . . . | .17¼ | . | .17¼ |
| Kino, tins . . . lb. | 2.00 | 2.10 | 2.00 | 4.50 | 2.50 | 4.50 |
| Mastic . . . lb. | 2.40 | 2.50 | .85 | 2.50 | .55 | .90 |
| Sandarac, prime quality, 200 lb bgs & 300 lb cks . . lb. | .50 | .55 | .35 | .37 | .15 | .37 |
| Senegal, picked bags . . . lb. | . . . | .30 | . . . | .30 | .25 | .30 |
| Sorts . . . lb. | . . . | .13 | . . . | .13 | .09¼ | .13 |
| Thus, bbls . . . 280 lbs. | 15.00 | 15.25 | 15.00 | 15.25 | 13.50 | 15.25 |
| Tragacanth, No. 1, cases . . lb. | 3.50 | 3.75 | 2.65 | 3.50 | 2.25 | 2.50 |
| No. 2 . . . lb. | 3.35 | 3.60 | 2.55 | 3.35 | 1.90 | 2.40 |
| No. 3 . . . lb. | 2.90 | 3.10 | 2.45 | 2.90 | 1.60 | 2.25 |
| Yacca, bgs . . . lb. | .03½ | .04 | .03½ | .04 | .03½ | .08 |

## H

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Helium, cyl (200 cu. ft.) cyl. | . . | 25.00 | . . . | 25.00 | . . . | 25.00 |
| Hematine crystals, 400 lb bbls lb. | .20 | .30 | .20 | .30 | .20 | .34 |
| Hemlock, 25%, 600 lb bbls. wks . . . lb. | . . . | .03⅛ | .03⅛ | .03⅜ | .03 | .03⅜ |
| tks . . . lb. | . . . | .02¾ | .02¾ | .03 | .02⅝ | .02¾ |
| Hexalene, 50 gal drs, wks lb. | . . . | .30 | . . . | .80 | . . . | .30 |

| | Current | Market | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Hexane, normal 60-70° C. Group 3, tks ........gal. | .. | .10½ | ... | .10½ | ... | .10½ |
| Hexamethylenetetramine, powd, drs ..........lb. | .32 | .33 | .32 | .33 | .32 | .36 |
| Hexyl Acetate, secondary, delv, drs ..........lb. | .13 | .13½ | .13 | .13½ | .13 | .13½ |
| tks ..........lb. | ... | .12 | ... | .12 | ... | .12 |
| Hoof Meal, f.o.b. Chicago unit | 2.20 | 2.25 | 2.00 | 3.15 | 2.50 | 3.25 |
| Hydrogen Peroxide, 100 vol, 140 lb cbys ..........lb. | .16½ | .18½ | .16½ | .20 | .19½ | .20 |
| Hydroxylamine Hydrochloride ..........lb. | ... | 3.15 | ... | 3.15 | ... | 3.15 |
| Hypernic, 51°, 600 lb bbls lb. | ... | .14 | ... | .14 | .13 | .21 |
| **I** | | | | | | |
| Indigo, Bengal, bbls .....lb. | 1.63 | 1.67 | 1.63 | 1.67 | ... | 2.40 |
| Synthetic, liquid .......lb. | .16½ | .19 | .16½ | .19 | .16½ | .19 |
| Iodine, Resublimed, jars..lb. | ... | 1.75 | 1.75 | 2.50 | 1.75 | 2.00 |
| Irish Moss, ord, bales ....lb. | .25 | .28 | .15 | .28 | .10 | .10 |
| Bleached, prime, bales...lb. | .32 | .35 | .28 | .35 | .19 | .20 |
| Iron Acetate Liq. 17°, bbls delv ..........lb. | .03 | .04 | .03 | .04 | .03 | .04 |
| Chloride see Ferric Chloride. | | | | | | |
| Nitrate, coml, bbls..100 lb. | 3.50 | 4.00 | 2.75 | 4.00 | 2.32 | 3.11 |
| Isobutyl Carbinol (128-132° C) drs, frt all'd ..........lb. | ... | .22½ | .22½ | .34 | .33 | .34 |
| tks, frt all'd ..........lb. | ... | .21½ | .21½ | .32 | ... | .32 |
| Isopropyl Acetate, tks, frt all'd ..........lb. | ... | .06 | .05½ | .06 | .051 | .06 |
| drs, frt all'd ..........lb. | .07 | .07½ | .06½ | .07½ | .061 | .07 |
| Ether, see Ether, isopropyl. | | | | | | |
| Keiselguhr, dom bags, c-l, Pacific Coast ..........ton | 22.00 | 35.00 | 22.00 | 35.00 | 22.00 | 35.00 |
| **L** | | | | | | |
| Lead Acetate, f.o.b. NY, bbls, White, broken ..........lb. | ... | .11 | ... | .11 | .10 | .11 |
| cryst, bbls ..........lb. | ... | .11 | ... | .11 | .10 | .11 |
| gran bbls ..........lb. | ... | .11¼ | ... | .11¼ | .10¾ | .11¼ |
| powd, bbls ..........lb. | ... | .11¼ | ... | .11¼ | .10¾ | .11¼ |
| Arsenate, East, drs .....lb. | .09 | .09½ | .08½ | .11 | .10 | .11½ |
| Linoleate, solid, bbls...lb. | ... | .19 | ... | .19 | ... | .19 |
| Metal, c-l, NY .....100 lb. | 5.65 | 5.70 | 4.90 | 5.70 | 4.75 | 5.55 |
| Nitrate, 500 lb bbls, wks lb. | .11 | .14 | .11 | .14 | .10 | .12 |
| Oleate, bbls ..........lb. | .18½ | .20 | .18½ | .20 | .18½ | .20 |
| Red, dry, 95% $Pb_3O_4$, delv ..........lb. | ... | .0815 | .07½ | .0815 | .07¼ | .08½ |
| 97% $Pb_3O_4$, delv ....lb. | ... | .0840 | .0765 | .0848 | .07½ | .0835 |
| 98% $Pb_3O_4$, delv ....lb. | ... | .0865 | .08 | .0865 | .07¾ | .0860 |
| Resinate, precip, bbls...lb. | ... | .16½ | ... | .16½ | ... | .16½ |
| Stearate, bbls ..........lb. | ... | .25 | ... | .26 | .22 | .25 |
| Titanate, bbls, c-l, f.o.b. wks, frt all'd ..........lb. | .10 | .10½ | .10 | .10½ | .11 | .11½ |
| White, 500 lb bbls, wks, lb. | ... | .07¼ | .07 | .07¼ | ... | .07 |
| Basic sulfate, 500 lb bbls, wks ..........lb. | ... | .06½ | .06¼ | .06½ | ... | .06¼ |
| Lime, chemical quicklime, f.o.b. wks, bulk .....ton | 7.00 | 13.00 | 7.00 | 13.00 | 7.00 | 8.00 |
| Hydrated, f.o.b. wks ...ton | 8.50 | 16.00 | 8.50 | 16.00 | 8.50 | 12.00 |
| Lime Salts, see Calcium Salts | | | | | | |
| Lime, sulfur, dealers, tks gal. | ... | .07½ | .07½ | .11½ | .08 | .11½ |
| drs ..........gal. | .10 | .14 | .11 | .16 | .11 | .16 |
| Linseed Meal, bgs .......ton | 27.00 | 28.00 | 23.50 | 37.00 | 34.00 | 42.00 |
| Litharge, coml, delv, bbls lb. | .0715 | .074 | .06½ | .07½ | .06¼ | .071 |
| Lithopone, dom, ordinary, delv, bgs ..........lb. | ... | .036 | ... | .036 | .03¾ | .04¼ |
| bbls ..........lb. | .. | .0385 | .03¾ | .03¾ | .04 | .04¼ |
| High strength, bgs .....lb. | ... | .05 | ... | .05 | .05¼ | .05¾ |
| bbls ..........lb. | ... | .05¼ | ... | .05¼ | .05½ | .05¾ |
| Titanated, bgs ..........lb. | ... | .05 | ... | .05 | .05¼ | .05¾ |
| bbls ..........lb. | ... | .05¼ | ... | .05¼ | .05½ | .05¾ |
| Logwood, 51°, 600 lb bbls lb. | .10½ | .12½ | .10½ | .12½ | .09½ | .12½ |
| Solid, 50 lb boxes .....lb. | .16½ | .20½ | .16½ | .20½ | .15 | .20½ |
| **M** | | | | | | |
| Madder, Dutch ..........lb. | .22 | .25 | .22 | .25 | .22 | .25 |
| Magnesite, calc, 500 lb bbls ton | 65.00 | 70.00 | 58.00 | 70.00 | 58.00 | 66.00 |
| Magnesium Carb, tech, 70 lb bgs, wks ..........lb. | ... | .06¼ | ... | .06¼ | .05¼ | .06½ |
| Chloride flake, 375 lb bbls, c-l, wks ..........ton | ... | 32.00 | 32.00 | 42.00 | 39.00 | 42.00 |
| Fluosilicate, crys, 400 lb bbls, wks ..........lb. | .10 | .10½ | .10 | .10½ | .10 | .10½ |
| Oxide, calc tech, heavy bbls, frt all'd ......lb. | ... | .26 | .25 | .30 | .25 | .30 |
| Light bbls above basis lb. | ... | .26 | .20 | .26 | .20 | .25 |
| USP Heavy, bbls, above basis ..........lb. | ... | .26 | .25 | .30 | .25 | .30 |
| Palmitate, bbls .......lb. | .33 | nom. | .33 | nom. | .33 | nom. |
| Silicofluoride, bbls .....lb. | .11 | .11½ | .11 | .11½ | .09½ | .11½ |
| Stearate, bbls ..........lb. | .23 | .26 | .23 | .27 | .21 | .24 |
| Manganese, acetate, drs ..lb. | ... | .26½ | ... | .26½ | ... | .26½ |
| Borate, 30%, 200 lb bbls lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Chlorate, 600 lb cks ....lb. | ... | .08½ | ... | .08½ | .07½ | .12 |
| Dioxide, tech (peroxide), paper bgs, c-l .......ton | ... | 70.00 | 62.50 | 70.00 | 47.50 | 66.50 |
| Hydrate, bbls ..........lb. | ... | .82 | ... | .82 | ... | .32 |
| Linoleate, liq, drs .....lb. | .18 | .19½ | .18 | .19½ | .18 | .19¼ |
| solid, precip, bbls ....lb. | ... | .19 | ... | .19 | ... | .19 |
| Resinate, fused, bbls ...lb. | .08¼ | .08½ | .08¼ | .08½ | .08¼ | .08½ |
| precip, drs ..........lb. | ... | .12 | ... | .12 | ... | .12 |
| Sulfate, tech, anhyd, 90-95%, 550 lb drs .....lb. | .10½ | .10¾ | .08 | .09¾ | .07 | .08½ |
| Mangrove, 55%, 400 lb bbls lb. | | | | ... | ... | .04 |
| Bark, African ..........ton | 35.00 | 36.00 | 30.00 | 39.50 | 23.00 | 35.00 |

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Mannitol, pure cryst, cs, wks lb. | ... | .90 | .90 | 1.00 | .95 | 1.20 |
| commercial grd, 250 lb bbls ... lb. | .38 | .45 | .38 | .50 | .42 | .57 |
| Marble Flour, blk ... ton | 12.00 | 14.00 | 12.00 | 14.00 | 12.00 | 14.00 |
| Mercury chloride (Calomel) lb. | ... | 2.70 | 2.45 | 2.95 | 1.36 | 2.57 |
| Mercury metal .. 76 lb. flasks | 170.00 | 171.00 | 170.00 | 228.50 | 95.00 | 170.00 |
| Mesityl Oxide, f.o.b. dest., tks ... lb. | ... | .15 | ... | .15 | .10½ | .15 |
| drs, c-l ... lb. | ... | .16 | ... | .16 | .11½ | .16 |
| drs, lcl ... lb. | ... | .16½ | ... | .16½ | .12 | .16½ |
| Meta-nitro-aniline ... lb. | .67 | .69 | .67 | .69 | .67 | .69 |
| Meta-nitro-paratoluidine 200 lb bbls ... lb. | 1.05 | 1.10 | 1.05 | 1.40 | 1.30 | 1.55 |
| Meta-phenylene diamine 300 lb bbls ... lb. | ... | .65 | ... | .65 | .80 | .84 |
| Meta-toluene-diamine 300 lb bbls ... lb. | ... | .65 | .65 | .67 | .65 | .67 |
| Methanol, denat, grd, drs, c-l frt all'd ... gal. | ... | .45 | ... | .45 | .41 | .46 |
| tks, frt all'd ... gal. | ... | .40 | ... | .40 | .35 | .40 |
| Pure, drs, c-l, frt all'd gal. | ... | .35½ | .35 | .38 | ... | .38 |
| tks ... gal. | ... | .30 | .30 | .33 | ... | .33 |
| 95%, tks ... gal. | ... | .29 | .28 | .31 | ... | .31 |
| 97%, tks ... gal. | ... | .30 | .29 | .32 | ... | .32 |
| Methyl Acetate, tech tks, delv ... lb. | .06 | .07 | .06 | .07 | .06 | .06½ |
| 55 gal drs, delv ... lb. | .07 | .08 | .07 | .08 | .07 | .08 |
| C.P. 97-99%, tks, delv lb. | .09½ | 10½ | .09½ | .10½ | ... | .06¼ |
| 55 gal drs, delv ... lb. | .10½ | .11½ | .10½ | .11½ | .07¼ | .07¼ |
| Acetone, frt all'd, drs gal. *p* | ... | .37½ | .41 | .44 | .30 | .44 |
| tks, frt all'd ... gal. *p* | ... | .32 | .35 | .39 | .25 | .35 |
| Synthetic, frt all'd, east of Rocky M., drs ... gal. *p* | ... | .36 | .36 | .44 | .38 | .41 |
| tks, frt all'd ... gal. | ... | .34 | .34 | .36 | ... | .31½ |
| West of Rocky M., frt all'd, drs ... gal *p* | ... | .48 | .42 | .48 | ... | .42 |
| tks, frt all'd .. gal. *p* | ... | .45½ | .35 | .45½ | ... | .35 |
| Anthraquinone ... lb. | ... | .83 | ... | .83 | ... | .83 |
| Butyl Ketone, tks ... lb. | ... | .10½ | ... | .10½ | ... | .10½ |
| Cellulose, 100 lb lots, frt all'd ... lb. | ... | .55 | .55 | .70 | ... | ... |
| less than 100 lbs. f.o.b. wks ... lb. | ... | .60 | .60 | .75 | ... | ... |
| Chloride, 90 lb. cyl ... lb. | .32 | .40 | .32 | .40 | .32 | .40 |
| Ethyl Ketone, tks, frt all'd lb. | ... | .06 | .05½ | .06 | .05 | .05½ |
| 50 gal drs, frt all'd, c-l lb. | .07 | .07½ | .06½ | .07½ | .06 | .07 |
| Formate, drs, frt all'd .. lb. | . | .89 | ... | .89 | .35 | .39 |
| Hexyl, Ketone, pure, drs lb. | ... | .60 | ... | .60 | ... | .60 |
| Lactate, drs, frt all'd .. lb. | ... | .80 | ... | .80 | ... | .30 |
| Mica, dry grd, bgs, wks .. ton | ... | 30.00 | ... | 30.00 | ... | 30.00 |
| Michler's Ketone, kgs ... lb. | ... | 2.50 | ... | 2.50 | ... | 2.50 |
| Monoamylamine, c-l, drs, wks lb. | | .52 | ... | .52 | ... | .52 |
| lcl, drs, wks ... lb. | .53 | .55 | .53 | .55 | ... | ... |
| tks, wks ... lb. | ... | .50 | ... | .50 | ... | ... |
| Monobutylamine, drs, c-l, wks ... lb. | ... | .50 | ... | .50 | .50 | .65 |
| lcl, wks ... lb. | .51 | .53 | .51 | .53 | ... | ... |
| tks, wks ... lb. | ... | .48 | ... | .48 | ... | ... |
| Monochlorobenzene, see "C" | | | | | | |
| Monoethanolamine, tks, wks, lb. | ... | .23 | ... | .23 | ... | .23 |
| Monoethylamine (100% basis) lcl, drs, f.o.b. wks ... lb. | ... | .65 | ... | .65 | ... | .. |
| Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb. | ... | .65 | ... | .65 | ... | .65 |
| Monomethylparamiosulfate, 100 lb drs ... lb. | 3.75 | 4.00 | 3.75 | 4.00 | 3.75 | 4.00 |
| Morpholine, drs 55 gal, lcl wks ... lb. | ... | .75 | ... | .75 | ... | ... |
| Myrobalans 25%, liq bbls lb. | no prices | | no prices | | .03¾ | .04¼ |
| 50% Solid, 50 lb boxes lb. | no prices | | no prices | | .04¾ | .05 |
| J1 bgs ... ton | ... | 37.00 | 28.50 | 40.00 | 24.00 | 50.00 |
| J2 bgs ... ton | ... | 30.00 | 23.00 | 34.00 | 19.00 | 41.00 |
| **N** | | | | | | |
| Naphtha, v.m.&p. (deodorized) see petroleum solvents. | | | | | | |
| Naphtha, Solvent, water-white, tks ... gal. | .. | .26 | .26 | .27 | .26 | .27 |
| drs, c-l ... gal. | ... | .31 | .31 | .32 | .31 | .32 |
| Naphthalene, dom, crude bgs, wks ... lb. | 2.25 | 2.50 | 2.25 | 2.75 | 2.25 | 2.85 |
| imported, cif, bgs ... lb. | no prices | | ... | 3.00 | 1.50 | 1.85 |
| Balls, flakes, pks ... lb. | .06¼ | .07¾ | .06¼ | .07¾ | .06½ | .07½ |
| Balls, ref'd bbls, wks .. lb. | ... | .07 | .06¾ | .07 | .05¾ | .06¾ |
| Flakes, re'd, bbls, wks lb. | ... | .07 | .06¾ | .07 | .05¾ | .06¾ |
| Nickel Carbonate, bbls ... lb. | .36 | .36½ | .36 | .36½ | .36 | .37½ |
| Chloride, bbls ... lb. | .18 | .20 | .18 | .20 | .18 | .20 |
| Metal ingot ... lb. | .34 | .36 | .34 | .35 | ... | .35 |
| Oxide, 100 lb kgs, NY lb. | .35 | .38 | .35 | .38 | .35 | .37 |
| Salt, 400 lb bbls, NY lb. | .13 | .13½ | .13 | .13½ | .13 | .13½ |
| Nicotine, 40%, drs, sulfate 55 lb drs ... lb. | ... | .70 | ... | .70 | .70 | .76 |
| Nitre Cake, blk ... ton | ... | 16.00 | ... | 16.00 | ... | 16.00 |
| Nitrobenzene redistilled, 1000 lb drs, wks ... lb. | .08 | .09 | .08 | .10 | .08 | .10 |
| tks ... lb. | .. | .07 | ... | .07 | .07 | .07½ |
| Nitrocellulose, c-l, lcl, wks lb. | .20 | .29 | .20 | .29 | .22 | .29 |
| Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis | ... | 1.2158 | ... | 1.2158 | ... | 1.2158 |
| Nitrogenous Mat'l, bgs imp unit | no prices | | 2.20 | 2.60 | 2.25 | 2.85 |
| dom, Eastern wks ... unit | ... | 2.20 | 2.20 | 2.90 | 2.30 | 3.00 |
| dom, Western wks ... unit | ... | 1.75 | 1.95 | 2.00 | 1.90 | 2.25 |
| Nitronaphthalene, 550 lb bbls lb. | .24 | .25 | .24 | .25 | .24 | .25 |
| Nutgalls Alleppo, bgs ... lb. | .29 | .30 | .29 | .30 | .22 | .23 |

*a* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Oak Bark Extract, 25%, bbls lb. | **.03⅛** | **.03⅜** | **.03⅛** | **.03⅜** | **.03⅛** | **.03½** |
| tks ... lb. | ... | **.02¾** | ... | **.02¾** | | **.02¾** |
| Octyl Acetate, tks, wks .. lb. | ... | **.15** | ... | **.15** | **.15** | **.17** |
| Orange-Mineral, 1100 lb cks NY ... lb. | .11¼ | .12½ | .10½ | .12½ | .10¼ | .10¾ |
| Orthoaminophenol, 50 lb kgs lb. | **2.15** | **2.25** | **2.15** | **2.25** | **2.15** | **2.25** |
| Orthoanisidine, 100 lb drs lb. | ... | **.70** | **.70** | **.74** | **.70** | **.74** |
| Orthochlorophenol, drs ... lb. | ... | **.32** | ... | **.32** | ... | **.32** |
| Orthocresol, 30.4°, drs, wks lb. | **.16** | **.16½** | **.16** | **.16½** | **.14½** | **.17½** |
| Orthodichlorobenzene, 1000 lb drs ... lb. | **.06** | **.07** | **.06** | **.07** | **.06** | **.07** |
| Orthonitrochlorobenzene, 1200 lb drs, wks ... lb. | **.15** | **.18** | **.15** | **.18** | **.15** | **.18** |
| Orthonitroparachlorphenol, tins ... lb. | ... | **.75** | ... | **.75** | ... | **.75** |
| Orthonitrophenol, 350 lb drs ... lb. | **.85** | **.90** | **.85** | **.90** | **.85** | **.90** |
| Orthonitrotoluene, 1000 lb drs, wks ... lb. | ... | **.09** | ... | **.09** | **.08** | **.10** |
| Orthotoluidine, 350 lb bbls, lcl ... lb. | ... | **.19** | ... | **.19** | **.16** | **.19** |
| Osage Orange, cryst, bbls lb. | ... | **.21** | ... | **.21** | **.17** | **.25** |
| 51° liquid ... lb. | ... | **.10** | ... | **.10** | **.07** | **.09** |
| **P** | | | | | | |
| Paraffin, rfd, 200 lb bgs | | | | | | |
| 122-127° M P ... lb. | ... | .057 | .02¼ | .0675 | .03¾ | .06¾ |
| 128-132° M P ... lb. | .057 | .0595 | .057 | .0705 | .04 | .0705 |
| 133-137° M P ... lb. | .06¼ | .06½ | .06¼ | .0755 | .0465 | .0755 |
| Para aldehyde, 99%, tech, 110-55 gal drs, wks .. lb. | **.10** | **.11¼** | **.10** | **.11¼** | **.10** | **.16*** |
| Aminoacetanilid, 100 lb kgs ... lb. | ... | **.85** | ... | **.85** | ... | **.85** |
| Aminohydrochloride, 100 lb kgs ... lb. | **1.25** | **1.30** | **1.25** | **1.30** | **1.25** | **1.30** |
| Aminophenol, 100 lb kgs lb. | ... | **1.05** | ... | **1.05** | ... | **1.05** |
| Chlorophenol, drs ... lb. | ... | **.32** | ... | **.32** | **.30** | **.45** |
| Dichlorobenzene 200 lb drs, wks ... lb. | **.11** | **.12** | **.11** | **.12** | **.11** | **.12** |
| Formaldehyde, drs, wks lb. | .23 | .24 | .34 | .35 | .34 | .35 |
| Nitroacetanilid, 300 lb bbls ... lb | **.45** | **.52** | **.45** | **.52** | **.45** | **.52** |
| Nitroaniline, 300 lb bbls, wks ... lb. | ... | **.47** | ... | **.47** | **.45** | **.47** |
| Nitrochlorobenzene, 1200 lb drs, wks ... lb. | ... | **.15** | **.15** | **.16** | **.15** | **.16** |
| Nitro-orthotoluidine, 300 lb bbls ... lb. | **2.75** | **2.85** | **2.75** | **2.85** | **2.75** | **2.85** |
| Nitrophenol, 185 lb bbls lb. | ... | **.35** | **.35** | **.37** | **.35** | **.37** |
| Nitrosodimethylaniline, 120 lb bbls ... lb. | **.92** | **.94** | **.92** | **.94** | **.92** | **.94** |
| Nitrotoluene, 350 lb bbls lb. | ... | **.30** | ... | **.30** | **.30** | **.35** |
| Phenylenediamine, 350 lb bbls ... lb. | **1.25** | **1.30** | **1.25** | **1.30** | **1.25** | **1.30** |
| Toluenesulfonamide, 175 lb bbls ... lb. | ... | **.70** | **.70** | **.75** | **.70** | **.75** |
| tks, wks ... lb. | ... | **.31** | ... | **.31** | ... | **.31** |
| Toluenesulfonchloride, 410 lb bbls, wks ... lb. | **.20** | **.22** | **.20** | **.22** | **.20** | **.22** |
| Toluidine, 350 lb bbls, wks ... lb. | ... | **.48** | **.48** | **.50** | **.48** | **.58** |
| Paris Green, dealers, drs lb. | .23 | .25 | .23 | .26 | .23 | .26 |
| Pentane, normal, 28-38° C, group, 3 tks ... gal. | ... | **.08½** | ... | .08½ | ... | .08½ |
| drs, group 3 ... gal. | **.11½** | .16 | **.11½** | .16 | .11½ | .16 |
| Perchlorethylene, 10 lb drs, frt all'd ... lb. | **.08** | **.08½** | **.08** | **.08¾** | **.08** | **.10½** |
| Petrolatum, dark amber, bbls ... lb. | ... | .02¾ | .02¾ | .05 | .02⅝ | .05 |
| White, lily, bbls ... lb. | ... | .04¾ | .04¾ | .08½ | .05¼ | .08½ |
| White, snow, bbls ... lb. | ... | .05½ | .05½ | .09½ | .06¼ | .09½ |
| Petroleum Ether, 30-60°, group 3, tks ... gal. | ... | **.13½** | ... | .13½ | .13 | .13½ |
| drs, group 3 ... gal. | ... | .14½ | .14½ | .25½ | .14 | .25½ |
| **PETROLEUM SOLVENTS AND DILUENTS** | | | | | | |
| Cleaners naphthas, group 3, tks ,wks ... gal. | **06⅞** | .07 | **.06⅞** | .07 | **.06⅜** | .07 |
| East Coast, tks, wks gal. | **.09** | **.10½** | .09 | **.10½** | .09 | .10 |
| Lacquer diluents, tks | | | | | | |
| East Coast ... gal. | **.09½** | .10 | **.09½** | .10 | .09 | .12½ |
| Group 3, tks ... gal. | ... | .07⅜ | .07⅜ | .07⅞ | .07⅜ | .08 |
| Naphtha, V.M.P., East tks, wks ... gal. | ... | .09½ | .09½ | .10 | .09 | .10 |
| Group 3, tks, wks ... gal. | .06⅞ | .07 | .06⅜ | .07⅞ | .06⅜ | .07 |
| Petroleum thinner, 43-47, East, tks, wks ... gal. | **.08¾** | **.09½** | **.08¾** | **.09½** | **.08½** | .10 |
| Group 3, tks, wks .. gal. | ... | **.05⅞** | **.05⅞** | .07 | .05⅜ | .06 |
| Rubber Solvents, stand grd, East, tks, wks .. gal. | ... | .09½ | .09½ | .10 | .09 | .10 |
| Group 3, tks, wks .. gal. | .06⅞ | .07 | .06⅜ | .07⅞ | .06⅜ | .07 |
| Stoddard Solvents, East, tks, wks ... gal. | **.08¾** | **.09½** | **.08¾** | **.09½** | **.08½** | .10 |
| Group 3, wks ... gal. | **.06⅜** | **.06½** | **.06⅜** | **.06½** | **.05⅞** | **.06½** |
| Phenol, 250-100 lb drs ... lb. | .12 | .13¾ | .12 | .14¾ | .13 | .15½ |
| tks, wks ... lb. | ... | .11 | .11 | .12 | .12 | .13½ |
| Phenyl-Alpha-Naphthylamine, 100 lb kgs ... lb. | ... | **1.35** | ... | **1.35** | ... | **1.35** |
| Phenyl Chloride, drs ... lb. | ... | **.17** | ... | **.17** | ... | **.17** |
| Phenylhydrazine Hydrochloride, com ... lb. | ... | **1.50** | ... | **1.50** | ... | **1.50** |
| Phloroglucinol, tech, tins lb. | **15.00** | **16.50** | **15.00** | **16.50** | **15.00** | **16.50** |
| CP, tons ... lb. | **20.00** | **22.00** | **20.00** | **22.00** | **20.00** | **22.00** |

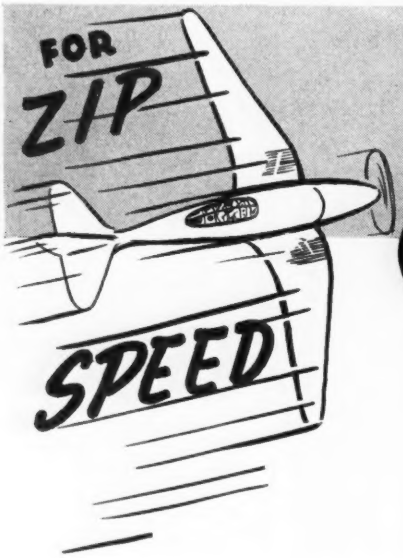
* These prices were on a delivered basis.

# Current

**Phosphate Rock**
**Rosins**

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Phosphate Rock, f.o.b. mines | | | | | | |
| 70% basis ........ ton | ... | 2.15 | 1.85 | 1.90 | ... | 1.85 |
| 72% basis ........ ton | ... | 2.40 | 2.15 | 2.35 | ... | 2.35 |
| Florida Pebble, 68% basis ton | ... | 1.90 | 1.90 | 2.85 | ... | 2.85 |
| 75-74% basis ........ ton | ... | 2.90 | 2.90 | 3.85 | ... | 3.85 |
| Tennessee, 72% basis .. ton | ... | 4.50 | ... | 4.50 | ... | 4.50 |
| Phosphorus Oxychloride 175 lb cyl ........ lb. | .15 | .18 | .15 | .20 | .16 | .20 |
| Red, 110 lb cases ...... lb. | .40 | .44 | .40 | .44 | .40 | .44 |
| Sesquisulfide, 100 lb cs .. lb. | .38 | .42 | .38 | .44 | .38 | .44 |
| Trichloride, cyl ........ lb. | .15 | .16 | .15 | .18 | .15 | .18 |
| Yellow, 110 lb cs, wks lb. | .18 | .20 | .18 | .20 | .24 | .30 |
| Phthalic Anhydride, ,100 lb drs, wks ........ lb. | .14½ | .15½ | .14½ | .15½ | ... | .14½ |
| Pine Oil, 55 gal drs or bbls | | | | | | |
| Destructive dist ........ lb. | .50 | .55 | .53 | .56 | .46 | .48 |
| Steam dist wat wh bbls gal. | ... | .59 | ... | .59 | ... | .59 |
| tks ........ gal. | ... | .54 | ... | .54 | ... | .54 |
| Pitch Hardwood, wks ... ton | 23.75 | 24.00 | 23.75 | 24.00 | 23.75 | 24.00 |
| Coaltar, bbls, wks .... ton | ... | 19.00 | ... | 19.00 | ... | 19.00 |
| Burgundy, dom, bbls, wks lb. | .05½ | .06 | .05½ | .06½ | .05½ | .06½ |
| Imported ........ lb. | no prices | | no prices | | .15 | .16 |
| Petroleum, see Asphaltum in Gums' Section. | | | | | | |
| Pine, bbls ........ bbl. | 6.00 | 6.50 | 6.00 | 6.50 | 6.00 | 6.25 |
| Platinum, ref'd ........ oz. | 34.00 | 36.00 | 35.00 | 40.00 | 32.00 | 40.00 |
| Potash, Caustic, wks, sol .. lb. | .06¼ | .06¾ | .06¼ | .06¾ | .06¼ | .06½ |
| flake ........ lb. | .07 | .07½ | .07 | .07½ | .07 | .07⅜ |
| liquid, tks ........ lb. | ... | .02⅞ | .02⅞ | .03¾ | ... | .02⅞ |
| Manure Salts, imported 30% basis, blk ... unit | ... | .60 | .53½ | .58½ | ... | .58½ |
| Potassium Abietate, bbls .. lb. | ... | .08 | .08 | .09 | ... | .09 |
| Acetate, tech, bbls, delv lb. | ... | .26 | ... | .26 | ... | .26 |
| Bicarbonate, USP, 320 lb bbls ........ lb. | ... | .17 | ... | .18 | ... | .18 |
| Bichromate Crystals, 725 lb cks* ........ lb. | .08⅞ | .09¼ | .08¾ | .09¼ | .08¾ | .09¼ |
| Binoxalate, 30 lb bbls .. lb. | ... | .23 | ... | .23 | ... | .23 |
| Bisulfate, 100 lb kgs ... lb. | .15½ | .18 | .15½ | .18 | .15½ | .18 |
| Carbonate, 80-85% calc 800 lb cks ........ lb. | .06½ | .06¾ | .06½ | .07 | .06½ | .07 |
| liquid, tks ........ lb. | ... | .0275 | .0275 | .03 | ... | .02⅞ |
| drs, wks ........ lb. | .03 | .03⅛ | .03 | .03½ | .03 | .03½ |
| Chlorate crys, 112 lb kgs, wks ........ lb. | ... | .11 | .10½ | .13 | .09¼ | .13 |
| gran, kgs ........ lb. | .12 | .14½ | .12 | .14½ | .12 | .14½ |
| powd, kgs ........ lb. | ... | .10 | .10 | .12½ | .08½ | .12½ |
| Chloride, crys, bbls .... lb. | .04 | nom. | .04 | .04¾ | .04 | .04¾ |
| Chromate, kgs ........ lb. | .24 | .27 | .24 | .27 | .19 | .28 |
| Cyanide, 110 lb cases .. lb. | ... | .75 | ... | .75 | .50 | .55 |
| Iodide, 250 lb bbls ..... lb. | ... | 1.20 | ... | 1.35 | 1.13 | 1.35 |
| Metabisulfite, 300 lb bbls lb. | no prices | | .13 | .15 | .11 | .18 |
| Muriate, bgs, dom, blk unit | ... | .53½ | ... | .53½ | ... | .53½ |
| Oxalate, bbls ........ lb. | .25 | .26 | .25 | .26 | .25 | .26 |
| Perchlorate, kgs, wks .. lb. | .09½ | .11 | .09½ | .11 | .09 | .10½ |
| Permanganate, USP, crys, 500 & 1000 lb drs, wks lb. | .20 | .20½ | .18½ | .20½ | .18½ | .19½ |
| Prussiate, red, bbls .... lb. | nom. | .45 | .38 | .45 | .30½ | .45 |
| Yellow, bbls ........ lb. | .16 | .18 | .15 | .18 | .14 | .16 |
| Sulfate, 90% basis, bgs ton | ... | 36.25 | 34.25 | 36.25 | 36.25 | 38.00 |
| Titanium Oxalate, 200 lb bbls ........ lb. | .40 | .45 | .40 | .45 | .35 | .45 |
| Pot & Mag Sulfate, 48% basis bgs ........ ton | ... | 27.00 | 24.75 | 27.00 | 24.75 | 25.75 |
| Propane, group 3, tks lb. | .03¾ | .04 | .03 | .04⅜ | .03 | .04⅜ |
| Putty, com'l, tubs .... 100 lb. | ... | 3 15 | ... | 6.00 | 3.00 | 6.00 |
| Linseed Oil, kgs .... 100 lb. | ... | 5.00 | ... | 4.50 | | 4.50 |
| Pyrethrum, conc liq: | | | | | | |
| 2.4% pyrethrins, drs, frt all'd ........ gal. | 4.75 | 4.95 | 4.75 | 7.50 | 5.75 | 7.50 |
| 3.6% pyrethrins, drs, frt all'd ........ gal. | ... | 7.20 | 7.20 | 11.00 | 8.45 | 11.00 |
| Flowers, coarse, Japan, bgs ........ lb. | .23 | .25 | .23 | .36 | .26 | .36 |
| Fine powd, bbls ...... lb. | .25 | .26 | .25 | .37 | .27 | .37 |
| Pyridine, denat, 50 gal drs gal. | | 1.71 | | 1.71 | 1.63 | 1.71 |
| Refined, drs ........ lb. | ... | .48 | ... | .51 | .50 | .51 |
| Pyrites, Spanish cif Atlantic ports, blk ........ unit | .12 | .13 | .12 | .13 | .12 | .13 |
| Pyrocatechin, CP, drs, tins lb. | 2.15 | 2.40 | 2.15 | 2.40 | 2.15 | 2.75 |
| **Q** | | | | | | |
| Quebracho, 35% liq tks .. lb. | ... | .03½ | .03¼ | .03½ | .02⅞ | .03⅜ |
| 450 lb bbls, c-l ...... lb. | ... | .04 | ... | .04 | .04 | .04⅛ |
| Solid, 63%, 100 lb bales cif ........ lb. | ... | .04½ | ... | .04½ | .04 | .04½ |
| Clarified, 64% bales lb. | ... | .04¾ | ... | .04¾ | .04¼ | .04¾ |
| Quercitron, 51 deg liq, 450 lb. bbls ........ lb. | .08½ | .09½ | .08½ | .09½ | .07½ | .08½ |
| Solid, drs ........ lb. | .11 | .16½ | .10 | .16½ | .10 | .12 |
| **R** | | | | | | |
| R Salt, 250 lb bbls, wks lb. | ... | .55 | ... | .55 | ... | .55 |
| Resorcinol, tech, cans ... lb. | .68 | .74 | .75 | .80 | .75 | .80 |
| Rochelle Salt, cryst ...... lb. | .27¼ | .27¾ | .22¼ | .27¾ | .17¾ | .21¾ |
| Powd, bbls ........ lb. | .26¼ | .26¾ | .21¾ | .26¾ | .16¾ | .20¼ |
| Rosin Oil, bbls, first run gal. | .45 | .50 | ... | .50 | .45 | .47 |
| Second run ........ gal. | .51 | .56 | .52 | .56 | .47 | .49 |
| Third run, drs ... gal. | .52 | .57 | .56 | .57 | .51 | .53 |
| Rosins 600 lb bbls, 100 lb unit ex. yard NY:*** | | | | | | |
| B ........ | | 2.45 | 1.80 | 2.45 | 4.60 | 5.45 |
| D ........ | 2.40 | 2.45 | 1.87 | 2.48 | 4.95 | 5.70 |
| E ........ | 2.43 | 2.48 | 1.95 | 2.51 | 5.20 | 6.40 |
| F ........ | 2.43 | 2.48 | 2.10 | 2.51 | 5.50 | 6.75 |
| G ........ | ... | 2.43 | 2.10 | 2.48 | 5.75 | 7.00 |
| H ........ | 2.43 | 2.48 | 2.10 | 2.48 | 5.75 | 7.10 |
| I ........ | 2.48 | 2.54 | 2.10 | 2.54 | 5.77½ | 7.20 |

* Spot prices are ⅛c higher; *** Nov. 30—1939, high and low based on 280 lb. unit.


FOR
ZIP
SPEED

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Rosins (continued) | | | | | | |
| K | 2.66 | 2.75 | 2.12 | 2.75 | 5.80 | 7.20 |
| M | ... | 2.81 | 2.20 | 2.81 | 5.90 | 7.25 |
| N | ... | 2.85 | 2.39 | 2.85 | 6.75 | 7.40 |
| WG | ... | 3.17 | 2.68 | 3.17 | 6.95 | 7.70 |
| WW | ... | 3.40 | 3.00 | 3.40 | 7.45 | 8.50 |
| Rosins, Gum, Savannah (280 lb. unit):** | | | | | | |
| B | ... | 1.80 | 1.15 | 1.80 | 3.25 | 4.00 |
| D | 1.75 | 1.80 | 1.22 | 1.83 | 3.55 | 4.30 |
| E | 1.78 | 1.83 | 1.30 | 1.86 | 3.80 | 5.00 |
| F | 1.78 | 1.83 | 1.45 | 1.86 | 4.00 | 5.35 |
| G | ... | 1.78 | 1.45 | 1.83 | 4.40 | 5.70 |
| H | 1.78 | 1.83 | 1.45 | 1.83 | 4.40 | 5.70 |
| I | 1.83 | 1.89 | 1.45 | 1.89 | 4.40 | 5.80 |
| K | 2.01 | 2.10 | 1.47 | 2.10 | 4.40 | 5.80 |
| M | ... | 2.16 | 1.55 | 2.16 | 4.40 | 5.85 |
| N | ... | 2.20 | 1.70 | 2.20 | 5.10 | 6.00 |
| WG | ... | 2.52 | 2.03 | 2.52 | 5.60 | 6.30 |
| WW | ... | 2.75 | 2.25 | 2.75 | 6.05 | 7.10 |
| X | ... | 2.75 | 2.35 | 2.75 | 5.60 | 7.10 |
| Rosin, Wood, c-l, FF grade, NY | 1.40 | 1.54 | 1.40 | 1.54 | 5.35 | 6.80 |
| Rotten Stone, bgs mines ton | 25.50 | 37.50 | 25.50 | 37.50 | 22.50 | 37.50 |
| Imported, lump, bbls ... lb. | no prices | | ... | .14 | ... | .14 |
| Powdered, bbls ...... lb. | no prices | | .08½ | .10 | .08½ | .10 |
| **S** | | | | | | |
| Sago Flour, 150 lb bgs .. lb. | .03½ | .04 | .04 | .04½ | .02½ | .04½ |
| Sal Soda, bbls wks ... 100 lb. | ... | 1.20 | ... | 1.20 | ... | 1.20 |
| Salt Cake, 94-96%, c-l, bulk wks ... ton | ... | 17.00 | ... | 17.00 | 19.00 | 25.00 |
| Chrome, c-l, wks ...... ton | ... | 16.00 | 11.00 | 16.00 | 11.00 | 12.00 |
| Saltpetre, gran, 450-500 lb bbls ... lb. | ... | .07¾ | .071 | .07¾ | .06½ | .069 |
| Cryst, bbls ... lb. | ... | .08¾ | .081 | .08¾ | .07½ | .0865 |
| Powd, bbls ... lb. | ... | .08¾ | .081 | .08¾ | .07½ | .079 |
| Satin, White, pulp, 550 lb bbls ... lb. | .01¼ | .01½ | .01¼ | .01½ | .01¼ | .01½ |
| Schaeffer's Salt, kgs .... lb. | ... | .46 | .46 | .48 | .46 | .48 |
| Shellac, Bone dry, bbls .. lb. *s* | .25 | .26 | .23 | .26 | .18 | .26 |
| Garnet, bgs ... lb. | .20 | .21 | .18½ | .23 | .12½ | .20 |
| Superfine, bgs ... lb. *s* | .16½ | .17½ | .14½ | .20½ | .10 | .21 |
| T. N., bgs ... lb. *s* | .16 | .17 | .13½ | .19½ | .09½ | .20 |
| Silver Nitrate, vials ..... oz. | ... | .26⅞ | .26⅞ | .27⅛ | .26⅞ | .33½ |
| Slate Flour, bgs, wks .... ton | 9.00 | 10.00 | 9.00 | 10.00 | 9.00 | 10.00 |
| Soda Ash, 58% dense, bgs, c-l, wks ... 100 lb. | .. | 1.10 | ... | 1.10 | ... | 1.10 |
| 58% light, bgs ..... 100 lb. | 1.05 | 1.08 | 1.05 | 1.08 | ... | 1.08 |
| blk ... 100 lb. | ... | .90 | ... | .90 | ... | .90 |
| paper bgs ... 100 lb. | ... | 1.05 | ... | 1.05 | ... | 1.05 |
| bbls ... 100 lb. | . . | 1.35 | ... | 1.35 | ... | 1.35 |
| Caustic, 76% grnd & flake, drs ... 100 lb. | ... | 2.70 | ... | 2.70 | . | 2.70 |
| 76% solid, drs ..... 100 lb. | ... | 2.30 | ... | 2.30 | 2.10 | 2.30 |
| Liquid sellers, tks .. 100 lb. | ... | 1.95 | 1.95 | 1.97½ | ... | 1.97½ |
| Sodium Abietate, drs ..... lb. | ... | .11 | ... | .11 | ... | .11 |
| Acetate, 60% tech, gran, powd, flake, 450 lb bbls wks ... lb. | .04 | .05 | .04 | .05 | .04 | .05 |
| 90%, bbls, 275 lb delv lb. | .06 | .06¾ | .06 | .06¾ | ... | ... |
| anhyd, drs, delv ..... lb. | .08¼ | .10 | .08¼ | .10 | .08¼ | .10 |
| Alginate, drs ... lb. | .39 | .70 | .39 | .96 | .70 | .95 |
| Antimoniate, bbls ...... lb. | .14½ | .15 | .14½ | .15 | .11½ | .16 |
| Arsenate, drs ... lb. | .07 | .08¾ | .07 | .08¾ | .08 | .08½ |
| Arsenite, liq, drs ..... gal. | .. | .35 | ... | .35 | .30 | .35 |
| Dry, gray, drs, wks .. lb. | .06½ | .09¼ | .06½ | .09½ | .07½ | .09½ |
| Benzoate, USP kgs .... lb. | .46 | .50 | .46 | .52 | .46 | .48 |
| Bicarb, powd, 400 lb bbl, wks ... 100 lb. | ... | 1.70 | 1.70 | 1.85 | ... | 1.85 |
| Bichromate, 500 lb cks, wks* ... lb. | .06⅞ | .07¼ | .06¾ | .07¼ | .06¾ | .07¼ |
| Bisulfite, 500 lb bbls, wks lb. | .03 | .031 | .03 | .031 | .031 | .036 |
| 35-40% sol bbls, wks 100 lb. | 1.40 | 1.80 | 1.30 | 1.80 | 1.40 | 1.80 |
| Chlorate, bgs, wks ..... lb. | ... | .06¼ | .06¼ | .08½ | .06¼ | .07½ |
| Cyanide, 96-98%, 100 & 250 lb drs, wks ...... lb. | .14 | .15 | .14 | .15 | .14 | .15 |
| Diacetate, 33-35% acid, bbls, lcl, delv ... lb. | ... | .09 | .08½ | .09 | ... | .09 |
| Fluoride, white 90%, 300 lb bbls, wks ... lb. | .07 | .08 | .07 | .08 | .07 | .08¼ |
| Hydrosulfite, 200 lb bbls. f.o.b. wks ... lb. | .16 | .17 | .16 | .17 | .16 | .17 |
| Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb. | ... | 2.80 | 2.80 | 3.05 | ... | 2.80 |
| Tech, reg cryst, 375 lb bbls, wks ... 100 lb. | 2.45 | ... | 2.45 | 2.80 | 2.45 | 2.80 |
| Iodide, jars ... lb. | ... | 2.42 | 2.30 | 2.42 | ... | 2.30 |
| Metanilate, 150 lb bbls .. lb. | .41 | nom. | .41 | .42 | .41 | .42 |
| Metasilicate, gran, c-l, wks ... 100 lb. | ... | 2.35 | ... | 2.35 | 2.20 | 2.35 |
| cryst, drs, c-l, wks 100 lb. | ... | 3.05 | ... | 3.05 | 2.90 | 3.05 |
| Anhydrous, wks, cl, drs ... 100 lb. | 3.75 | 3.75 | 3.75 | 3.75 | 3.75 | 3.75 |
| wks, lcl, drs, .. 100 lb. | 5.05 | 5.05 | 5.05 | 5.05 | 5.05 | 5.05 |
| Monohydrated, bbls .... lb. | ... | .023 | ... | .023 | ... | .023 |
| Naphthenate, drs ...... lb. | .12 | .19 | .12 | .19 | .12 | .19 |
| Naphthionate, 300 lb bbl lb. | ... | .50 | ... | .50 | .50 | .54 |
| Nitrate, 92% crude, 200 lb. bgs, c-l, NY ... ton | ... | 28.70 | ... | 28.30 | ... | 28.30 |
| 100 bgs, same basis .. ton | ... | 29.40 | ... | 29.00 | ... | 29.00 |
| Bulk ... ton | . | 27.00 | . | 27.00 | ... | 27.00 |
| Nitrite, 500 lb bbls .... lb. | .06¾ | .11½ | .06¾ | .11½ | .06¾ | .11½ |
| Othochlorotoluene, sulfonate, 175 lb bbls, wks lb. | .25 | .27 | .25 | .27 | .25 | .27 |
| Orthosilicate, 300 lb drs, c-l ... lb. | ... | .03 | ... | .03 | ... | .03 |
| Perborate, drs, 400 lb .. lb. | .14¾ | .15¼ | .14¾ | .15¼ | .14¾ | .15¼ |

*r* Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; *s* T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. * Spot price is ⅛c higher. ** Nov. 30—1939, high and low based on 280 lb. unit.

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Sodium (continued): | | | | | | |
| Peroxide, bbls, 400 lb .. lb. | .. | .17 | ... | .17 | . | .17 |
| Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb. | ... | 2.30 | ... | 2.30 | 2.05 | 2.30 |
| bgs, wks 100 lb. | ... | 2.10 | ... | 2.10 | 1.85 | 2.10 |
| Tri-sodium, tech, 325 lb bbls, wks ...... 100 lb. | ... | 2.45 | ... | 2.45 | 2.20 | 2.45 |
| bgs, wks ... 100 lb. | .. | 2.25 | | 2.25 | 2.00 | 2.25 |
| Picramate, 160 lb kgs .. lb. | ... | .65 | .65 | .67 | .65 | .67 |
| Prossiate, Yellow, 350 lb bbls, wks ... lb. | .10½ | .10¾ | .09½ | .10¾ | .09½ | .10¾ |
| Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb. | ... | .051 | ... | .0530 | ... | .0530 |
| Sesquisilicate, drs, c-l, wks ... 100 lb. | ... | 2.90 | ... | 2.90 | 2.80 | 2.90 |
| Silicate, 60°, 55 gal drs, wks ... 100 lb. | 1.40 | 1.80 | 1.40 | 1.80 | 1.65 | 1.70 |
| 40°, 55 gal drs, wks 100 lb | . | .80 | .. | .80 | ... | .80 |
| tks, wks ... 100 lb. | .. | .65 | ... | .65 | ... | .65 |
| Silicofluoride, 450 lb bbls NY ... lb. | no prices | | no prices | | .03½ | .04¾ |
| Stannate, 100 lb drs .... lb. | .32½ | .35½ | .31½ | .35½ | .30 | .35 |
| Stearate, bbls ... lb. | .19 | .24 | .19 | .24 | .19 | .24 |
| Sulfanilate, 400 lb bbls lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Sulfate, Anhyd, 550 lb bgs c-l, wks ..... 100 lb. *t* | 1.45 | 1.65 | 1.45 | 1.90 | 1.45 | 1.90 |
| Sulfide, 80% cryst, 440 lb. bbls, wks ... lb. | .02¼ | .03 | .02¼ | .03 | .02¼ | .02½ |
| Solid, 650 lb drs, c-l, wks ... lb. | .03 | .03¾ | .03 | .03¾ | .03 | .03½ |
| Sulfite, powd, 400 lb bbls wks ... lb. | ... | .05¼ | .023 | .05¼ | .023 | .02½ |
| Sulfocyanide, drs ...... lb. | .28 | .47 | .28 | .47 | .28 | .47 |
| Sulforicinoleate, bbls ... lb. | ... | .12 | ... | .12 | ... | .12 |
| Supersilicate (see sodium sesquisilicate) | | | | | | |
| Tungstate, tech, crys, kgs lb. | no prices | | no prices | | 1.05 | 1.10 |
| Sorbitol, com, solut, wks c-l, drs, wks ... lb. | ... | .14¾ | .14¾ | .16 | ... | .15½ |
| Spruce, Extract, ord, tks .. lb. | ... | .01⅛ | ... | .01⅛ | ... | .01⅛ |
| Ordinary, bbls ..... lb. | ... | .01⅜ | ... | .01⅜ | ... | .01⅜ |
| Super spruce ext, tks .. lb. | ... | .01⅜ | ... | .01⅜ | ... | .01⅜ |
| Super spruce ext, bbls .. lb. | ... | .01⅞ | ... | .01⅞ | .. | .01⅞ |
| Super spruce ext, powd, bgs ... lb. | ... | .04 | | .04 | | .04 |
| Starch, Pearl, 140 lb bgs 100 lb. | ... | 2.90 | 2.50 | 2.95 | 2.40 | 2.85 |
| Powd, 140 lb bgs ... 100 lb. | | 3.00 | 2.60 | 3.05 | 2.50 | 2.90 |
| Potato, 200 lb bgs ..... lb. | .04½ | .05½ | .05 | .07½ | .04 | .06¾ |
| Imp, bgs ... lb. | no prices | | | .06½ | .05 | .06½ |
| Rice, 200 lb bbls lb. | .07½ | .08½ | .07¼ | .08½ | .06¼ | .07¼ |
| Sweet Potato, 240 lb bbls, f.o.b. plant ..... 100 lb. | nom. | 7.00 | 5.50 | 7.00 | 5.50 | 7.50 |
| Wheat, thick, bgs ..... lb. | ... | .05 | .05¼ | .05½ | .05 | .05½ |
| Strontium, carbonate, 600 lb bbls, wks ... lb. | no prices | | .22 | .23 | .16 | .24 |
| Nitrate, 600 lb bbls, NY lb. | .07¼ | .08¼ | .07¼ | .08¼ | .07¼ | .08¼ |
| Sucrose, octa-acetate, den, grd, bbls, wks ... lb. | ... | .45 | . | .45 | ... | .45 |
| tech, bbls, wks ... lb. | ... | .40 | | .40 | | .40 |
| Sulfur, crude, f.o.b. mines ton | | 16.00 | | 16.00 | | 16.00 |
| Flour, com'l, bgs ... 100 lb. | 1.40 | 1.95 | 1.40 | 2.35 | 1.65 | 2.35 |
| bbls ... 100 lb. | 1.95 | 2.50 | 1.95 | 2.70 | 1.95 | 2.70 |
| Rubbermakers, bgs 100 lb. | | 2.00 | 2.00 | 2.80 | 2.20 | 2.80 |
| bbls ... 100 lb. | .. | 2.35 | 2.35 | 3.15 | 2.55 | 3.15 |
| Extra fine, bgs ... 100 lb. | . | 2.35 | 2.85 | 3.00 | 2.85 | 3.00 |
| Superfine, bgs ... 100 lb. | 2.65 | 2.80 | 2.65 | 2.80 | 2.65 | 2.80 |
| bbls ... 100 lb. | 2.25 | 3.10 | 2.25 | 3.10 | 2.25 | 3.10 |
| Flowers, bgs ... 100 lb. | 2.80 | 3.35 | 2.80 | 3.75 | 3.00 | 3.75 |
| bbls ... 100 lb. | 3.15 | 3.70 | 3.15 | 4.10 | 3.35 | 4.10 |
| Roll, bgs ... 100 lb. | 2.15 | 2.70 | 2.15 | 3.10 | 2.35 | 3.10 |
| bbls ... 100 lb. | 2.30 | 2.85 | 2.50 | 3.25 | 2.50 | 3.25 |
| Sulfur Chloride, 700 lb drs, wks ... lb. | .03 | .08 | .03 | .08 | .03 | .04 |
| Sulfur Dioxide, 150 lb cyl lb. | .07 | .09 | .07 | .09 | .07 | .09 |
| Multiple units, wks ... lb. | .04½ | .07 | .04½ | .07 | .04½ | .07 |
| tks, wks ... lb. | .04 | .06 | .04 | .06 | .04 | .05 |
| Refrigeration, cyl, wks lb. | .16 | .40 | .16 | .40 | .16 | .17 |
| Mutiple units, wks .... lb. | .07½ | .10 | .07½ | .10 | .07½ | .10 |
| Sulfuryl Chloride ... lb. | .15 | .40 | .15 | .40 | .15 | .40 |
| Sumac, Italian, grd ..... ton | no prices | | 98.00 | 140.00 | 65.50 | 85.00 |
| Extract, 42°, bbls ...... lb. | .06 | .06¼ | .06 | .06¼ | .05¼ | .06¼ |
| Superphosphate, 16% bulk, wks ... ton | ... | 8.50 | 8.50 | 9.00 | 8.00 | 9.00 |
| Run of pile ... ton | ... | 8.00 | 8.00 | 8.50 | 7.50 | 8.50 |
| Triple, 40-48%, a.p.a. bulk, wks, Balt. unit ..... ton | ... | .68 | .68 | .70 | .. | .70 |
| **T** | | | | | | |
| Talc, Crude, 100 lb bgs, NY ton | 14.00 | 16.00 | 14.00 | 15.00 | 13.00 | 15.00 |
| Ref'd 100 lb bgs, NY ton | 17.25 | 19.25 | 14.00 | 17.25 | 14.00 | 16.00 |
| French, 220 lb bgs, NY ton | no prices | | 23.00 | 35.00 | 23.00 | 30.00 |
| Ref'd, white bgs, NY ton | no prices | | 45.00 | 60.00 | 45.00 | 60.00 |
| Italian, 220 lb bgs to arr ton | no prices | | 64.00 | 70.00 | 60.00 | 70.00 |
| Ref'd, white bgs,, NY ton | no prices | | 65.00 | 78.00 | 65.00 | 70.00 |
| Tankage, Grd, NY ... unit *u* | ... | 2.50 | 2.35 | 3.25 | 2.75 | 3.25 |
| Ungrd ... unit *u* | ... | 2.50 | 2.35 | 3.25 | 2.75 | 5.00 |
| Fert grade, f.o.b. Chgo unit *u* | ... | 2.50 | 2.20 | 3.50 | 2.50 | 4.50 |
| South American cif unit *u* | ... | 2.60 | 2.50 | 3.50 | 3.00 | 4.00 |
| Tapioca Flour, high grade, bgs ... lb. | .03 | .05 | .02¾ | .05 | .01¾ | .05½ |
| Tar Acid Oil, 15%, drs .. gal. | .22 | .24 | .22 | .24 | .21 | .24 |
| 25% drs ... gal. | .25 | .27 | .25 | .28 | .25 | .28 |
| Tar, pine, delv, drs .... gal. | .26 | .27 | .26 | .27 | .25 | .27 |
| tks, delv, E. cities ... gal. | .. | .21 | | .21 | .20 | .21 |
| Tartar Emetic, tech, bbls lb. | .34¾ | nom. | .34¾ | .35 | .27¾ | .35 |
| USP, bbls ... lb. | .40 | nom. | . . | .40 | .33 | .40 |
| Terpineol, den grade, drs lb. | | .17 | | .17 | | .17 |
| Tetrachlorethane, 650 lb drs lb. | .08 | .08½ | .08 | .08½ | .08 | .08½ |
| Tetrachlorethylene, drs, tech lb. | .08 | .09 | .08 | .09½ | . | .09½ |
| Tetralene 50 gal drs, wks lb. | ... | .18 | .12 | .18 | .12 | .13 |
| Thiocarbanilid, 170 lb bbls lb. | ... | .24 | .20 | .25 | .20 | .25 |

*t* Bags 15c lower; *u* + 10.

## Prices

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Tin, crystals, 500 lb. bbls, wks lb. | .38 | .38½ | .36 | .40½ | .35½ | .39 |
| Metal, NY ... lb. | *... | .502 | .45½ | .55 | .45½ | .60 |
| Oxide, 300 lb bbls, wks lb. | .54 | .56 | .51 | .56 | .50 | .54 |
| Tetrachloride, 100 lb drs, wks ... lb. | ... | .24¾ | .23 | .26½ | .23 | .32 |
| Titanium Dioxide, 300 lb bbls lb. | .13¼ | .14 | .13 | .16 | .13¼ | .16 |
| Barium Pigment, bbls .. lb. | .05¼ | .06½ | .05¼ | .06½ | .05⅝ | .06½ |
| Calcium Pigment, bbls lb. | .05¼ | .06¼ | .05 | .06¼ | .05⅜ | .06½ |
| Titanium tetrachloride, drs, f.o.b. Niagara Falls ... lb. | .32 | .45 | .32 | 45 | .32 | .45 |
| Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb. | .22 | .26 | .22 | .26 | .22 | .26 |
| 20% solution, bbls ... lb. | .175 | .215 | .175 | .215 | .175 | .215 |
| Toluidine, mixed, 900 lb drs, wks ... lb. | ... | .26 | .26 | .27 | .26 | .27 |
| Toluol, 110 gal drs, wks gal. | ... | .32 | .27 | .32 | ... | .27 |
| 8000 gal tks, frt all'd gal. | ... | .27 | .22 | .27 | ... | .22 |
| Toner Lithol, red, bbls ... lb. | .55 | .60 | .55 | .60 | .55 | .80 |
| Para, red, bbls ... lb. | .70 | .75 | .70 | .75 | .70 | .80 |
| Toluidine, bgs ... lb. | ... | 1.05 | 1.05 | 1.35 | ... | 1.35 |
| Triacetin, 50 gal drs, wks, lb. | ... | .26 | ... | .26 | ... | .26 |
| Triamyl Borate, lcl, drs, wks, lb. | ... | .27 | ... | .27 | ... | .27 |
| Triamylamine, c-l, drs, wks lb. | .. | .77 | ... | .77 | .77 | 1.25 |
| lcl, wks, drs ... lb. | .78 | .80 | .78 | .80 | ... | ... |
| tks, wks ... lb. | ... | .75 | ... | .75 | ... | ... |
| Tributylamine, lcl, drs, wks lb. | ... | .07 | .67 | .70 | ... | .70 |
| c-l, drs, wks ... lb. | ... | .07½ | .66 | .67 | ... | ... |
| tks, wks ... lb. | ... | .06½ | ... | .65 | ... | ... |
| Tributyl citrate, drs, frt all'd lb. | .24 | .26 | .24 | .35 | .35 | .45 |
| Tributyl Phosphate, frt all'd lb. | . | .42 | ... | .42 | ... | .42 |
| Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb. | .08 | .09 | .08 | .09 | .08 | .09½ |
| Tricresyl phosphate, tech, drs lb. | .22 | .36½ | .22 | .36½ | .22 | .37½ |
| Triethanolamine, 50 gal drs, wks ... lb. | ... | .19 | .19 | .22 | .21 | .22 |
| tks, wks ... lb. | ... | .18 | .18 | .20 | ... | .20 |
| Triethylamine, lcl, drs, f.o.b. wks ... lb. | ... | 1.05 | ... | 1.05 | ... | . |
| Triethylene glycol, drs, wks lb. | ... | .26 | ... | .26 | ... | .26 |
| Trihydroxyethylamine Oleate, bbls ... lb. | .. | .30 | ... | .30 | ... | .30 |
| Stearate bbls ... lb. | ... | .30 | ... | .30 | ... | .30 |
| Trimethyl Phosphate, drs, lcl, f.o.b. dest ... lb. | ... | .50 | ... | .50 | ... | .50 |
| Trimethylamine, c-l, drs, frt all'd E. Mississippi ... lb. | . | 1.00 | ... | 1.00 | . | 1.00 |
| Triphenylguanidine ... lb. | .58 | .60 | .58 | .60 | .58 | .60 |
| Triphenyl Phosphate, drs . lb. | . | .38 | ... | .38 | ... | .38 |
| Tripoli, airfloated, bgs, wks ton | ... | 26.00 | 26.00 | 30.00 | 26.00 | 30.00 |
| Turpentine (Spirits), c-l, NY dock, bbls ... gal. | ... | .43½* | .32½ | .40 | .29 | .35 |
| Savannah, bbls ... gal. | ... | .31½* | .26½ | .34 | .23½ | .29 |
| Jacksonville, bbls ... gal. | no prices | | .26 | .34¾ | .23½ | .26¾ |
| Wood Steam dist, drs, c-l, NY ... gal. | ... | .37* | .27 | .34½ | .242 | .34 |
| Wood, dest dist, l-c-l, drs, delv E. cities ... gal. | ... | .40* | .23 | .32 | .22 | .25 |
| **U** | | | | | | |
| Urea, pure 112 lb cases .. lb. | ... | .12 | .12 | .15½ | .14½ | .15½ |
| Fert grade, bgs, c. i. f. S.A. points ... ton | no prices | | ... | 110.00 | 95.00 | 110.00 |
| Dom f.o.b., wks ... ton | ... | 85.00 | 85.00 | 101.00 | 95.00 | 101.00 |
| Urea Ammonia, liq., nitrogen basis ... ton | ... | 121.50 | ... | 121.50 | ... | ... |
| **V** | | | | | | |
| Valonia beard, 42%, tannin bgs ... ton | no prices | | 47.00 | 56.00 | 45.00 | 57.00 |
| Cups, 32% tannin bgs .. ton | no prices | | 33.00 | 39.00 | 27.00 | 39.00 |
| Extract, powd, 63% . lb. | no prices | | .0565 | .06 | .05 | .06 |
| Vanillin, ex eugenol, 25 lb tins, 2000 lb lots ... lb. | ... | 2.60 | ... | 2.60 | 2.20 | 2.60 |
| Ex-guaiacol ... lb. | ... | 2.50 | ... | 2.50 | 2.10 | 2.50 |
| Ex-lignin ... lb. | ... | 2.50 | ... | 2.50 | 2.10 | 2.50 |
| Vermilion, English, kgs .. lb. | no prices | | ... | 2.76 | 1.50 | 2.97 |
| **W** | | | | | | |
| Wattle Bark, bgs ... ton | 37.50 | 39.50 | 34.00 | 38.75 | 34.50 | 40.00 |
| Extract, 60°, tks, bbls .. lb. | ... | .03⅞ | .03⅞ | .04¼ | .04 | .05½ |
| Wax, Bayberry, bgs ... lb. | .20 | .21 | .25 | .30 | .16⅞ | .39 |
| Bees, bleached, white 500 lb slabs, cases ... lb. | ... | .36½ | .35 | .38 | .33 | .40½ |
| Yellow, African, bgs .. lb. | ... | .30 | .23 | .29 | .18½ | .30 |
| Brazilian, bgs ... lb. | .31 | .32 | .24 | .31 | .21 | .33 |
| Refined, 500 lb slabs, cases lb. | .35 | .36 | .29 | .36 | .25½ | .36 |
| Candelilla, bgs ... lb. | .19 | .19½ | .18 | .19 | .15¼ | .19 |
| Carnauba, No. 1, yellow, bgs ... lb. | .73 | .74 | .58 | .85 | .36¾ | .78 |
| No. 2, yellow, bgs ... lb. | .72 | .73 | .57 | .84 | .35¾ | .45 |
| No. 2, N. C., bgs ... lb. | .69 | .70 | .46 | .73 | .34 | .41 |
| No. 3, Chalky, bgs ... lb. | .62 | .63 | .43 | .66 | .27½ | .46 |
| No. 3, N. C., bgs ... lb. | .62 | .63 | .47 | .68 | .28¾ | .49 |
| Ceresin, dom, bgs ... lb. | .11 | .11½ | .11½ | .15 | .08½ | .15 |
| Japan, 224 lb cases ... lb. | .18½ | .19 | .15½ | .16½ | .09¾ | .18 |
| Montan, crude, bgs . lb. | no prices | | no prices | | .11 | .11¾ |
| Paraffin, see Paraffin Wax. | | | | | | |
| Spermaceti, blocks, cases lb. | .24 | .25 | .22 | .25 | .18 | .25 |
| Cakes, cases ... lb. | .25 | .26 | .23 | .25 | .19 | .26 |
| Whiting, chalk, com 200 lb bgs, c-l, wks ... ton | 16.00 | 20.00 | 12.00 | 20.00 | 12.00 | 14.00 |
| Gilders, bgs, c-l, wks .. ton | ... | 11.50 | 11.50 | 18.50 | ... | 15.00 |
| Wood Flour, c-l, bgs ... ton | 24.00 | 25.00 | 20.00 | 30.00 | 20.00 | 30.00 |
| Xylol, frt all'd, East 10° tks, wks ... gal. | ... | .29 | ... | .30 | .29 | .30 |
| Com'l tks, wks, frt all'd gal. | ... | .26 | ... | .27 | .26 | .27 |
| Xylidine, mixed crude, drs lb. | .35 | .36 | .35 | .36 | .35 | .36 |
| Zein, bgs, 1000 lb lots, wks ... lb. | ... | .20 | ... | .20 | ... | ... |

* Nov. 30. ‡ May 31.

# Current

**Zinc Acetate**
**Oil, Whale**

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Zinc Acetate, tech, bbls, lcl, delv ......lb. | .15 | .16 | .15 | .16 | -.15 | .21 |
| Arsenite, bgs, frt all'd ..lb. | ... | .12 | .12 | .12½ | .12 | .13 |
| Carbonate tech, bbls, NY lb. | .14 | .16 | .14 | .16 | .14 | .15 |
| Chloride fused, 600 lb drs, wks ......lb. | ... | .04¼ | .04¼ | .046 | .04¼ | .046 |
| Gran, 500 lb drs, wks lb. | ... | .05 | .05 | .05¾ | .05 | .05¾ |
| Soln 50%, tks, wks 100 lb. | ... | 2.25 | ... | 2.25 | ... | 2.25 |
| Cyanide, 100 lb drs ....lb. | ... | .33 | ... | .33 | ... | .33 |
| Dust, 500 lb bbls, c-l, delv lb. | ... | .09¼ | .07½ | .08½ | .06½ | .08½ |
| Metal, high grade slabs, c-l, NY ......1000 lb. | ... | 7.64 | 5.90 | 7.64 | 4.84 | 6.40 |
| E. St. Louis .....100 lb. | ... | 7.25 | 4.60 | 7.25 | 4.60 | 6.00 |
| Oxide, Amer, bgs, wks lb. | ... | .06½ | .06¼ | .07½ | .06¼ | .07½ |
| French 300 lb bbls, wks lb. | ... | .08 | .06¼ | .07¾ | .06½ | .07¾ |
| Palmitate, bbls ......lb. | .24½ | .27½ | .23 | .27½ | .23 | .25 |
| Resinate, fused, pale bbls lb. | ... | .10 | ... | .10 | ... | .10 |
| Stearate, 50 lb bbls .....lb. | ... | .22 | .21½ | .24½ | .20 | .24½ |
| Sulfate, crys, 40 lb. bbls wks ......lb. | ... | .029 | .0275 | .029 | ... | .029 |
| Flake, bbls ......lb. | ... | .0325 | ... | .0325 | ... | .0325 |
| Sulfide, 500 lb bbls, delv lb. | ... | .07¾ | .07¾ | .08 | .07¾ | .08⅞ |
| bgs, delv ......lb. | ... | .07½ | .07½ | .07¾ | .07½ | .08⅝ |
| Sulfocarbolate, 100 lb kgs lb. | .24 | .29 | .24 | .26 | .24 | .26 |
| Zirconium Oxide, crude, 70-75% grd, bbls, wks ton | 75.00 | 100.00 | 75.00 | 100.00 | 75.00 | 100.00 |

### Oils and Fats

| | Current Market | | 1940 Low | 1940 High | 1939 Low | 1939 High |
|---|---|---|---|---|---|---|
| Babassu, tks, futures .....lb. | nom. | .05⅞ | .05¾ | .06⅝ | .05⅞ | .07⅝ |
| Castor, No. 3, 400 lb drs lb. | nom. | .09¾ | .09¾ | .12¾ | .08¼ | .12¾ |
| Blown, 400 lb drs ...lb. | nom. | .11¾ | .11¾ | .14¾ | .10¼ | .14¾ |
| China Wood, drs, spot NY lb. | ... | .26¾ | .22½ | .28 | .15 | .28 |
| Tks, spot NY ......lb. | ... | .25¾ | .21½ | .27 | .14½ | .27 |
| Coconut, edible, drs NY ..lb. | ... | .07½ | .07½ | .09⅜ | .08⅛ | .10⅛ |
| Manila, tks, NY ......lb. | ... | .02⅞ | .02¾ | .03⅜ | .02⅞ | .04⅝ |
| Tks, Pacific Coast ....lb. | .02⅝ | .02¾ | .02¾ | .03½ | .02⅝ | .04⅜ |
| Cod, Newfoundland, 50 gal bbls ......gal. | ... | .60 | .60 | .72 | .29 | .72 |
| Copra, bgs, NY ......lb. | nom. | .0145 | .0165 | .0190 | .0160 | .2625 |
| Corn, crude, tks, mills ...lb. | ... | .05½ | .05⅛ | .06½ | .05⅛ | .07⅛ |
| Refd, 375 lb bbls, NY ..lb. | .08 | .08½ | .07⅞ | .09 | .07½ | .09¾ |
| Degras, American, 50 gal bbls, NY ......lb. | .08 | .08½ | .08 | .10 | .07 | .10 |
| Greases, Yellow ......lb. | nom. | .04⅜ | .03 | .05¼ | .03⅞ | .06¾ |
| White, choice, bbls, NY lb. | nom. | .04¾ | .03⅜ | .05⅝ | .04½ | .07½ |
| Lard, Oil, Edible, prime ..lb. | .. | .08½ | .08 | .10 | .09 | .11¼ |
| Extra, bbls ......lb. | ... | .08¼ | .06¾ | .09⅜ | .08 | .10⅜ |
| Extra, No. 1, bbls .....lb. | ... | .08 | .06⅞ | .08⅞ | .07¾ | .10⅛ |
| Linseed, Raw less than 5 bbl lots ......lb. | .093 | .095 | .09 | .116 | .092 | .119 |
| bbls, c-l, spot ......lb. | .087 | .089 | .084 | .110 | .084 | .111 |
| Tks ......lb. | .081 | .083 | .078 | .104 | .078 | .104 |
| Menhaden, tks, Baltimore gal. | nom. | .30 | .21 | .35 | .21 | .35 |
| Refined, alkali, drs .....lb. | ... | .08 | .067 | .079 | .062 | .082 |
| Tks ......lb. | ... | .074 | .061 | .071 | .056 | .076 |
| Kettle boiled, drs ......lb. | ... | .092 | .079 | .093 | .074 | .094 |
| Light pressed, drs .....lb. | ... | .074 | .061 | .075 | .056 | .076 |
| Tks ......lb. | ... | .068 | .055 | .069 | .067 | .069 |
| Neatsfoot, CT, 20°, bbls, NY lb. | ... | .15¼ | .15¼ | .19¼ | .14¾ | .19¼ |
| Extra, bbls, NY ......lb. | ... | .08¼ | .06⅞ | .09 | .08 | .10⅛ |
| Pure, bbls, NY ......lb. | ... | .10¾ | .08 | .14¼ | .10¾ | .16¾ |
| Oiticica, bbls ......lb. | .18½ | .19½ | .17 | .21 | .09¼ | .21 |
| Oleo, No. 1, bbls, NY ...lb. | ... | .07⅜ | .07⅜ | .07¾ | .07¼ | .12 |
| No. 2, bbls, NY ......lb. | . | .07⅛ | .07 | .07½ | .06¾ | .11¾ |
| Olive, denat, bbls, NY ..gal. | nom. | 2.40 | .94 | 2.40 | .82 | 1.40 |
| Edible, bbls, NY .....gal. | ... | 3.25 | 1.85 | 3.25 | 1.75 | 2.25 |
| Foots, bbls, NY ......lb. | .. | .10¼ | .08 | .10¼ | .06¾ | .10 |
| Palm, Kernel, bulk ......lb. | no prices | | no prices | | .034 | .036 |
| Niger, cks ......lb. | nom. | .03½ | .03¼ | .05½ | .03⅝ | .05½ |
| Sumatra, tks ......lb. | ... | .02 | .02⅛ | .03 | .0265 | .02¾ |
| Peanut, crude, bbls, NY lb. | | .09 | .06¾ | .09 | .06 | .08 |
| Tks, f.o.b. mill ......lb. | nom. | .05⅛ | .05⅛ | .07⅛ | .05¼ | . 7¼ |
| Refined, bbls, NY .....lb. | .. | .07⅝ | .07⅜ | .09¾ | .08¾ | .10¾ |
| Perilla, drs, NY ......lb. | .. | .18 | .19 | .21 | .09½ | .16½ |
| Tks, Coast ......lb. | .. | .17¼ | .18½ | .20 | .089 | .15¾ |
| Pine, see Pine Oil, Chem. Sec. | | | | | | |
| Rapeseed, blown, bbls, NY lb. | nom. | .17½ | .17 | .17½ | .14 | .17½ |
| Denatured, drs, NY ..gal. | nom. | 1.02 | 1.00 | 1.05 | .80 | 1.05 |
| Red, Distilled, bbls ......lb. | .06¾ | .07¼ | .06¼ | .09½ | .06¾ | .09½ |
| Tks ......lb. | ... | .06¼ | .05¾ | .08 | .064 | .08½ |
| Sardine, Pac Coast, tks ..gal. | nom. | .40 | .31 | .39 | .24 | .38 |
| Refined alkali, drs .....lb. | ... | .08 | .067 | .081 | .062 | .082 |
| Tks ......lb. | ... | .074 | .061 | .075 | .056 | .076 |
| Light pressed, drs .....lb. | ... | .074 | .061 | .075 | .056 | .076 |
| Tks ......lb. | ... | .068 | .055 | .069 | .05 | .07 |
| Sesame, white, dom ......lb. | ... | .07¼ | .07¼ | .11¾ | .09 | .12 |
| Soy Bean, crude | | | | | | |
| Dom, tks, f.o.b. mills ..lb. | | .04¾ | .04¾ | .06¼ | .04½ | .06½ |
| Crude, drs, NY .....lb. | .06 | .06½ | .05¾ | .07¾ | .05⅛ | .07⅝ |
| Ref'd, drs, NY ......lb. | .07¼ | .08 | .07¼ | .08½ | .06⅜ | .09 |
| Tks ......lb. | .06½ | .07 | .06¼ | .07⅝ | .05¾ | .07¾ |
| Sperm, 38° CT, bleached bbls, NY ......lb. | ... | .11 | .105 | .11 | .09 | .103 |
| 45° CT, blchd, bbls, NY lb. | ... | .103 | .098 | .103 | .083 | .096 |
| Stearic Acid, double pressed dist bgs ......lb. | .09½ | .10½ | .09¾ | .13 | .10 | .13½ |
| Double pressed saponified bgs ......lb. | .09¾ | .10¾ | .10 | .13¾ | .10¼ | .13¾ |
| Triple pressed dist bgs lb. | .12½ | .13½ | .12½ | .16½ | .12¾ | .16½ |
| Stearine, Oleo, bbls ......lb. | nom. | .06¼ | .05¼ | .06½ | .05½ | .12 |
| Tallow City, extra loose ..lb. | nom. | .04¼ | .03⅜ | .05⅜ | .04⅜ | .07 |
| Edible, tierces ......lb. | nom. | .04¾ | .04⅜ | .05¾ | .04½ | .07¾ |
| Acidless, tks, NY .....lb. | ... | .07¼ | .06¼ | .08 | .07 | .09¼ |
| Turkey Red, single, drs ..lb. | ... | .07 | .082 | .09 | .06 | .08⅝ |
| Double, bbls ......lb. | ... | .11 | .11 | .12¾ | .08¾ | .11¼ |
| Whale: | | | | | | |
| Winter bleach, bbls, NY lb. | ... | 095 | ... | .095 | .075 | .095 |
| Refined, nat, bbls, NY lb. | ... | .091 | ... | .091 | .071 | .091 |

# The Chemical MARKET PLACE

(CLASSIFIED ADVERTISEMENTS)

**Local Stocks**
**Chemicals • Equipment**

**Raw Materials**
**Specialties • Employment**

## Massachusetts

**ALAN A. CLAFLIN**
*Manufacturer's Agent*
**DYESTUFFS and CHEMICALS**
Specializing in
**BENTONITE**
AND
**TALC**
88 Broad Street Boston, Mass.
TELEPHONE Liberty 5944 - 5945

**DOE & INGALLS, INC.**
*Chemicals and Solvents*
*Full List of Our Products, see Chemical Guide-Book*
Everett Station, Boston EVErett 4610

**E. & F. KING & Co., Inc.**
Est. 1834
399-409 Atlantic Avenue
Boston, Mass.
*Industrial Chemicals*
($CO_2$)
*Solid Carbon Dioxide*

## Rhode Island

**GEORGE MANN & CO., INC.**
251 Fox Pt. Blvd., Providence, R. I.
(Phone—Gaspee 8466)
*Branch Office*
NORTH STATION INDUSTRIAL BLDG.
150 Causeway St., Boston, Mass.
(Phone—Capital 2217 and 2218)
**Industrial Chemicals**
**Glycerine**
**Stearic Acid**

**GLYCERINE**
*Heavy Chemicals*
*Textile Specialties*
**J. U. STARKWEATHER CO.**
INCORPORATED
729 Hospital Trust Bldg.
Providence, R. I.

## Pennsylvania

FOR ALL INDUSTRIAL USES
**CHEMICALS**
*SINCE 1855*
AFCO BRAND
Spot Stocks
Technical Service
**ALEX. C. FERGUSSON CO.**
Drexel Building PHILADELPHIA, PA.
Lombard 2410-11-12

## Ohio

**METHYL METHACRYLATE**
MONOMERIC (Liquid)
Also known as Acrylic Liquid
$CH_2 = C(CH_3) - COOCH_3$
Chemically Pure
*Quotations and samples upon request*
**INTERNATIONAL SPECIALTIES, INC.**
406 Madison Avenue
P. O. Box 212 CS Toledo, Ohio

## Patents

**PATENT YOUR IDEAS**
IDEAS
send a Sketch or Model of your invention for
**CONFIDENTIAL ADVICE**
FREE CONSULTATION LITERATURE
Z. H. Polachek
1234 BROADWAY NEW YORK
PATENT ATTORNEY ENGINEER
U. S. Pat. Off. records searched for ANY Invention or Trade Mark

## Illinois

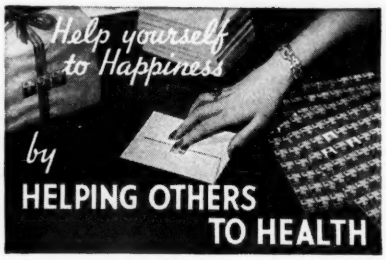
**METHYL METHACRYLATE**
Monomeric (Liquid)
$CH_2 = C(CH_3) — COOCH_3$
CHEMICALLY PURE
*Quotations and samples upon request*
**CONSOLIDATED CHEMICAL MFG. CO.**
5537 West Congress Street Chicago, Ill.
STAte 9326

**CHEMICALS**
*"From an ounce to a carload"*
SEND FOR OUR CATALOG
**ARTHUR S. LaPINE & COMPANY**
LABORATORY SUPPLIES AND REAGENTS
INDUSTRIAL CHEMICALS
114 WEST HUBBARD STREET
• CHICAGO •

## New York

**CHEMICALS**
**GUMS • WAXES • OILS**
*for all industrial uses*
**Spot or Future**
**EDWARD P. PAUL & CO., INC.**
Established 1898
1133 Broadway New York City

**HORMONES**
**PHARMACEUTICALS**
**VITAMINS**
RARE CHEMICALS • AMINO ACIDS • SUGARS
**HERMAN MEYER DRUG COMPANY, INC.**
17 STATE STREET NEW YORK
WHitehall 4-5105 Cable: Sulfanyl




This Christmas—be a partner in a great life-saving campaign. Use plenty of Christmas Seals on your letters and packages. They are gay, colorful . . . and what's more important . . . they spread a message of Tuberculosis control and prevention that is vital to the good health of us all!
Since 1907, the annual sale of Christmas Seals has done its share in helping to reduce the death rate from Tuberculosis by 75%! Complete eradication is now in sight! But no one is safe from Tuberculosis until everyone is safe. So help yourself—by helping others!

**BUY CHRISTMAS SEALS**
The National, State and Local Tuberculosis Associations in the United States

## RATES

**CLASSIFIED—DISPLAY**

**One time—$5.00 an inch**
**Six times—$4.50 an inch**
**Twelve times—$4.00 an inch**

**HELP WANTED • SITUATIONS WANTED**

**$1.00 for 20 words or less; extra words, 5c each**

**CASH WITH ORDER**

### *Business Opportunities*

WANT MORE BUSINESS? Get it with our monthly house organ. 250 copies, $7.50; 500, $10. Two colors. Keeps customers, prospects, thinking about you. Full front page for your advertising. Get samples. Crier, Inc., 1840 East 87th St., Cleveland, Ohio.

WANTED—REPRESENTATION FOR VENEZUELA. CHEMICALS AND PROCESS MACHINERY. A. G. Bulgaris, Chemical Engineer, Apartado 1752, Caracas, Venezuela. Experienced. References available.

### *Situations Wanted*

SALES DEVELOPMENT

Graduate chemist, four years teaching experience in leading universities, eight years diversified production, research experience agricultural and industrial products; four years practical agronomy (fertilizers, insecticides, fungicides); thorough knowledge of sales development methods; wide acquaintanceship in the chemical and agricultural fields; desires connection in agricultural field work. Now employed, but seeks opportunity where training and experience can be utilized by progressive company. Box 1416, CHEMICAL INDUSTRIES.

### *Professional Services*

**Ehrlich, J., Ph.D.**

CONSULTING CHEMIST

153 South Doheny Drive
Beverly Hills, California

ORGANIC SYNTHESES

*Fellow of the American Institute of Chemists*

**E. L. LUACES**

*U. S. and Foreign Patents*

**Chemistry • Engineering**

1107 Broadway, New York City

Tel. CHelsea 3-3600

### *Machinery For Sale*

**CONSOLIDATED OFFERS:**

2—Devine 5' x 33' Rotary Vacuum Dryers; 6—4' x 20'.
1—No. 10 Sweetland Filter, 2" c.c.; other smaller sizes.
1—Badger 30" dia. all copper Distillation Unit, complete.
1—9' Copper Vacuum Coil Pan.
1—Duriron 750-gallon Jacketed Kettle.
2—8' x 125' Rotary Kilns; 5—6' x 60'.
1—Shriver 42" x 42" Castiron Filter Presses, plate and frame, 30 chambers; other sizes up to 7½".
1—W. & P. Vacuum Mixer, 100 gals.
1—Zaremba triple effect Evaporator, 2100 sq. ft. per effect.

**Only a partial list.**

Did you receive your copy of the Latest Edition of the Consolidated News?

**We buy your idle Machinery.**

**CONSOLIDATED PRODUCTS CO., INC.**

13-18 PARK ROW NEW YORK, N. Y.

Shops and Warehouse: 335 Doremus Ave., Newark, N. J.

**GUARANTEED**
**NEW AND REBUILT EQUIPMENT**
FOR THE CHEMICAL AND PROCESS INDUSTRIES

| | |
|---|---|
| AUTOCLAVES: | 1 gallon single shell Agitated. 50 gallon single shell Agitated. 500 gallon Oil heated Agitated. |
| DRYERS: | Stokes 4' x 15' rotary Vacuum; Devine 17 Shelf—59" x 78"; Devine 20 Shelf—59" x 78"; Devine 17 Shelf—40" x 43"; Steam Heated Truck Dryers. |
| EVAPORATORS: | Triple Effect, Copper; 6' and 7' Copper Pans; Steel, double Effect, with Salt Filters. |
| MILLS and PULVERIZERS: | Raymond, 2 roll, high side; Raymond, 3 roll, high side; Greundler, Hammermill, 75 H.P., D.C. motor; Day, #1 and #2 Disintegrators; Stroud, Class 2 Pulverizers. |
| FILTER-PRESSES: | Stainless Steel 24" x 24" complete. Sweetland, Standard #5; Kelley #450; Shriver, Sperry, Johnson 12" to 30", plate and frame and recessed plate types. |
| KETTLES: | Bethlehem, 8' x 4'6", jacktd. and Agitated Processing Kettles, for pressure and vacuum. Two Copper Closed and Agitated Kettles with heating Coils. 250 gallon Stainless Steel Jacketed and Agitated Tank. Dopp 150 gallon and 400 gallon Jacketed Kettles. |

Send for latest issue: "FIRST FACTS."

**FIRST MACHINERY CORP.**

FMC

9th St. & EAST RIVER DRIVE
NEW YORK CITY

### *Technical Literature*

**T. E. R. SINGER**

**Technical Literature Searches, Bibliographies and Abstracting,**

**501 Fifth Avenue, New York**

Murray Hill 2-5346-7

### *Formulas*

*FOR NEW and ORIGINAL IDEAS*

**IRA I. SLOMON**
**ADHESIVE SPECIALIST**
L. I. CITY, N. Y.

*RUBBER and LACQUER RESEARCH*

**Busy Executives**

***read***

**CHEMICAL INDUSTRIES**

**Always at their finger tips CHEMICAL INDUSTRIES is a dependable source of information. New chemicals, new uses, chemical reports and trends are but a few of the topics authoritatively discussed.**

**Every executive in the chemical industry will profit by a personal subscription. Price $3.00 a year. Fill in and mail coupon below today.**

Signed ____________

Position ____________

Company ____________

Business ____________

Address ____________

City ____________ State ____________

☐ *Check enclosed* ☐ *Send bill*

# *Index to Advertisers*

# Index to Advertisers

# "We"—Editorially Speaking

A Joyous and Merry Christmas to you and yours!

And a Happy and Prosperous New Year—and may the coming year somehow witness a return to a saner and more peaceful world.

We, in particular, at this time of the year wish to express our most hearty thanks to the members of our Consulting Editorial Board who unselfishly, and without compensation of any sort, except the personal satisfaction of having performed a worthwhile service to the industry, have contributed so materially to the editorial contents of the magazine and who by their mature judgment and wise suggestions have greatly increased its value to its readers.

We are delighted to announce that Mack H. Williams, one of the younger but very well-known and highly capable men in the corps of Washington correspondents, will fill the place of the late Russell Kent as the Washington correspondent for CHEMICAL INDUSTRIES. Mr. Williams entered newspaper work in Pennsylvania, then moved on to more responsible posts with dailies in New York and Tennessee. For a number of years he was news editor for four business papers published by Trade Newspapers Corp., New York City. Mr. Williams has been the Washington correspondent for several papers for the past two years. Mr. Williams' Washington Page will be found on Page 654 of this issue.

We solace ourselves when we find it necessary to report corrections and omissions in the Buyer's Guidebook Number with the thought that no edition of the Bible has yet been published without a number of errors.

On page 611 in the description of AROCHEM (Stroock & Wittenberg) the word Paranol should have been omitted. Paranol is the tradename for modified phenolic resins manufactured and sold by Paramet Chemical. On the same page the word Paradura should have been omitted in the description of AROFENE. Paradura is the tradename of Paramet Chemical for pure phenolic resins. Also on the same page the word Esterol should have been omitted from the description of AROPLAZ (Stroock & Wittenberg). Esterol is Paramet's tradename for alkyd resins.

On page 637 the word Esterol is described as a lacquer solvent belonging to U. S. Industrial Chemicals. As stated, Esterol is Paramet's tradename for alkyd resins.

In the latest edition the telephone number for Niagara Alkali is given incorrectly in the buying section. The correct phone number is MUrray Hill 2-8090.

The correct telephone number for Commercial Solvent's New York Offices is VAnderbilt 6-1600.

Our sincere apologies to these companies. In as large and as complicated type of compilation work as the Guidebook Number is, it is extremely difficult to entirely prevent errors from creeping in. But we do like to make amends, and so, if your company is not correctly listed in any respect we would deem it a distinct favor on your part to inform us promptly so that steps can be taken at once to make the necessary changes on our master records.

### *Fifteen Years Ago*

*From our Files of December, 1925.*

**Dr. Wm. H. Nichols, chairman of the board of Allied Chemical and Dye Corp., has presented New York University with $600,000 for the erection of a chemistry building.**

**Urging that Muscle Shoals be sold and privately developed, President Coolidge in his annual message to Congress stated that it should be used primarily for the production of nitrates and incidently for power.**

**The fifth annual meeting of the American Association of Textile Chemists and Colorists is held at Boston on December 4 and 5.**

**E. A. Johnson, in charge of the New York office of the Monsanto Chemical Works, will go to the main office of the company in charge of general sales of intermediates. Victor E. Williams will succeed Mr. Johnson in the New York office.**

**Fourth annual meeting of the Synthetic Organic Chemical Manufacturers' Association is held in New York at the Hotel Commodore on December 11.**

**The index number for the chemical industry for October was 188 as compared with 165 for same month last year, taking 1919 as 100 per cent.**

**Samuel S. C. Henry was re-elected president of the National Drug Trade Conference.**

**The Customs Service of the Treasury Department has found that there is no dumping of methanol on the American market from Germany.**

### *Definitions—*

An Engineer:

Is said to be a man who knows a great deal about very little and who goes along knowing more and more about less and less until finally he knows practically everything about nothing; whereas,

A Salesman:

On the other hand is a man who knows very little about a great deal and keeps knowing less and less about more and more until he knows practically nothing about everything.

A Purchasing Agent:

Starts out knowing practically everything about everything, but ends up knowing nothing about anything, due to his association with engineers and salesmen.

—*Marine Journal*, New York.

"What do you believe is the most important future development chemistry can make for the welfare of mankind?"

Addressed to 18,000 visitors at the Du Pont Company's World's Fair exhibit, this cross-section study of the hopes and aspirations of America revealed:

More than 4,500—exceeding 25 per cent. of the answers—looked to chemistry for medicines and drugs to check disease. This group was by far the largest to express kindred sentiments on any one subject.

Of this number, more than a third specified a cure for cancer as the anticipated apex of scientific progress, greatest percentage to cite any single ailment. Next: the common cold.

Some 3,240, or 18 per cent., gave their attention to clothing—better fabrics and longer lasting materials such as "shoes that never need repairing."

Advances in food production, notably a demand for concentrated meals in capsule form, was cited by 1,750, nearly 10 per cent. of the total.

General answers, which naturally accounted for a large numerical percentage, bracketed a wide field, ranging from "a cheap substitute fuel for automobiles" to dishes that require no dishwashing.

Homely, day-to-day longings were reflected in the most common responses. Baldness, graying hair, obesity, tooth decay, painful shaving and similarly popular complaints were aired. Hay-fever and various allergies were deemed worthy of speedy attention.

Other needs which people hoped modern chemistry would solve included:

Rubber fenders that bounce off garage doors, vest-pocket air conditioners, chipproof nail polish, plastic houses, completely effective insect-killers, synthetic furs, durable lip sticks, non-skid highways, fireproof wood, a filter to remove all dust from the air, unbreakable eyeglasses and transparent steel.

12/27/40

## State of Chemical Trade

**Current Statistics (Nov. 30, 1940)—p. 70**

### WEEKLY STATISTICS OF BUSINESS

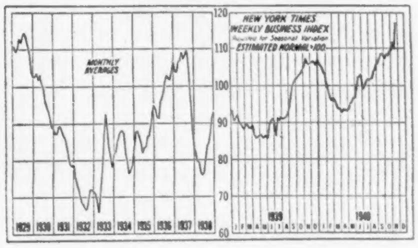
| Week Ending | Carloadings 1940 | Carloadings 1939 | Carloadings % of Change | Electrical Output* 1940 | Electrical Output* 1939 | Electrical Output* % of Change | Jour. of Com. Price Index | Nat'l Chem. & Drugs | Fertilizer Fats & Oils | Fertilizer Ass'n Price Indices Fert. Mat. | Fertilizer Ass'n Price Indices Mixed Fert. | Fertilizer Ass'n Price Indices All Groups | †Labor Dept. Chem. & Drug Price Index | % Steel Activity | N. Y. Times Index Bus. Act. | Fisher Commodity Index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nov. 2 | 794,797 | 801,108 | — .8 | 2,734,402 | 2,536,765 | + 7.8 | 81.4 | 97.6 | 43.8 | 72 | 78.6 | 76.1 | 77.1 | 96.0 | 109.7 | 120.0 |
| Nov. 9 | 778,318 | 781,588 | — .4 | 2,719,501 | 2,513,699 | + 8.2 | 82.0 | 97.6 | 44.5 | 72.1 | 78.6 | 76.7 | 77.2 | 96.1 | 111.5 | 119.5 |
| Nov. 16 | 745,295 | 766,987 | — 3.25 | 2,751,528 | 2,514,350 | + 9.4 | 81.9 | 97.6 | 46.1 | 72.3 | 78.6 | 77.0 | 77.4 | 96.6 | 106.9 | 118.3 |
| Nov. 23 | 733,488 | 673,113 | + 9 | 2,695,431 | 2,481,882 | + 8.6 | 81.5 | 97.6 | 46.6 | 72.4 | 78.6 | 77.1 | 77.5 | 96.6 | 117.0 | 118.3 |

* K.W.H. 000 omitted. † 1926-1928 = 100.00.

### MONTHLY STATISTICS

| CHEMICAL: | Oct. 1940 | Oct. 1939 | Sept. 1940 | Sept. 1939 | 1940 Aug. | 1939 Aug. |
|---|---|---|---|---|---|---|
| *Acid, sulfuric* (expressed as 50° Baumé, short tons, Bureau of the Census) | | | | | | |
| Total prod. by fert. mfrs. .... | 222,476 | 205,024 | 193,243 | 153,897 | 194,664 | 161,791 |
| Consumpt. in mfr. fert. ....... | 169,878 | 175,338 | 140,444 | 134,287 | 153,215 | 115,119 |
| Stocks end of month .......... | 105,557 | 75,377 | 103,532 | 74,113 | 91,732 | 72,536 |
| *Alcohol, Industrial* (Bureau Internal Revenue) | | | | | | |
| Ethyl alcohol prod., proof gal.. | ...... | 20,965,125 | 21,559,233 | 18,104,177 | 24,094,279 | 18,539,035 |
| Comp. denat. prod., wine gal .. | ...... | 4,906,872 | 3,093,302 | 2,101,668 | 1,828,289 | 580,681 |
| Removed, wine gal. .......... | ...... | 5,175,243 | 3,097,747 | 2,182,164 | 1,726,587 | 481,463 |
| Stocks end of mo., wine gal... | ...... | 412,987 | 738,171 | 685,736 | 747,274 | 767,662 |
| Spec. denat. prod., wine gal. .. | ...... | 10,274,257 | 10,600,276 | 10,523,022 | 9,681,922 | 8,610,026 |
| Removed, wine gal. ......... | ...... | 10,277,452 | 11,058,758 | 10,665,895 | 9,468,110 | 8,717,897 |
| Stocks end of mo., wine gal... | ...... | 1,083,197 | 1,707,215 | 1,090,505 | 2,171,894 | 1,239,267 |
| Ammonia sulfate prod., tons *a*.. | ...... | 59,256 | 62,482.5 | 52,992 | 62,254 | 60,718 |
| Benzol prod., gal. *b* ........... | ...... | 10,891,000 | 11,054,000 | 9,660,000 | 11,357,000 | 11,727,000 |
| Byproduct coke prod., tons *a*... | ...... | 4,526,602 | 4,627,401 | 3,890,600 | 4,682,073 | 4,619,156 |
| *Cellulose Plastic Products* (Bureau of the Census) | | | | | | |
| Nitrocellulose sheets, prod., lbs. | 748,779 | 967,740 | 736,372 | 861,073 | 610,141 | 759,235 |
| Sheets, ship., lbs. ............ | 767,010 | 884,318 | 745,068 | 840,886 | 670,897 | 741,297 |
| Rods, prod., lbs. ............. | 248,384 | 262,792 | 256,678 | 219,012 | 208,565 | 243,985 |
| Rods, ship., lbs. ............. | 273,758 | 262,835 | 282,714 | 239,439 | 246,200 | 244,699 |
| Tubes, prod., lbs. ............ | 99,236 | 84,155 | 100,236 | 84,253 | 71,455 | 65,426 |
| Tubes, ship., lbs. ............ | 95,183 | 84,127 | 85,636 | 76,123 | 52,445 | 79,332 |
| Cellulose acetate, sheets, rod, tubes | | | | | | |
| Production, lbs. .............. | 983,292 | 713,241 | 826,248 | 705,640 | 772,928 | 1,041,430 |
| Shipments, lbs. .............. | 944,361 | 683,637 | 754,786 | 676,669 | 783,686 | 814,634 |
| Molding comp., ship.; lbs. .. | 1,783,269 | 1,332,699 | 1,501,463 | 1,152,791 | 1,341,994 | 967,367 |
| *Methanol* (Bureau of the Census) | | | | | | |
| Production, crude, gals. ........ | 463,165 | 463,420 | 365,786 | 404,876 | 407,764 | 359,594 |
| Production, synthetic, gals. .... | 4,408,026 | 4,158,161 | 3,548,808 | 2,639,934 | 3,787,794 | 2,678,983 |
| *Pyroxylin-Coated Textiles* (Bureau of the Census) | | | | | | |
| Light goods, ship., linear yds... | ...... | 3,722,046 | 2,698,218 | 3,291,353 | 2,833,467 | 2,819,719 |
| Heavy goods, ship., linear yds... | ...... | 2,760,091 | 2,408,096 | 2,215,824 | 2,519,383 | 2,323,008 |
| Pyroxylin spreads, lbs. *c* ...... | ...... | 6,371,331 | 5,127,772 | 6,243,461 | 5,366,381 | 5,580,850 |
| *Exports* (Bureau of Foreign & Dom. Commerce) | | | | | | |
| Chemicals and related prod. *d*.. | ...... | $19,774 | $16,664 | $20,000 | $19,568 | $15,000 |
| Crude sulfur *d* ............... | ...... | $1,547 | $1,663 | $874 | $1,436 | $1,450 |
| Coal-tar chemicals *d* .......... | ...... | $1,798 | $1,939 | $1,114 | $2,462 | $1,105 |
| Industrial chemicals *d* ......... | ...... | $5,160 | $3,802 | $4,152 | $4,574 | $2,391 |
| *Imports* | | | | | | |
| Chemicals and related prod. *d*.. | ...... | $13,445 | $3,051 | $11,338 | $4,737 | $11,224 |
| Coal-tar chemicals *d* .......... | ...... | $1,604 | $445 | $1,494 | $734 | $1,037 |
| Industrial chemicals *d* ......... | ...... | $1,421 | $574 | $1,254 | $1,734 | $967 |
| *Employment* (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals | | | | | | |
| Chemicals and allied prod., including petroleum ............ | ...... | 122.0 | 122.6 | 118.0 | 119.4 | 109.2 |
| Other than petroleum .......... | ...... | 121.8 | 122.6 | 123.1 | 118.6 | 105.9 |
| Chemicals ..................... | ...... | 133.6 | 143.4 | 123.6 | 141.6 | 119.1 |
| Explosives .................... | ...... | 104.2 | 147.8 | 90.9 | 139.9 | 93.3 |
| *Payrolls* (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals | | | | | | |
| Chemicals and allied prod., including petroleum ............ | ...... | 133.1 | 138.2 | 124.6 | 134.8 | 119.0 |
| Other than petroleum .......... | ...... | 131.0 | 137.8 | 121.5 | 134.0 | 113.8 |
| Chemicals ..................... | ...... | 157.9 | 172.3 | 139.7 | 171.0 | 136.3 |
| Explosives .................... | ...... | 125.2 | 175.4 | 114.4 | 172.1 | 109.1 |
| Price index chemicals* ......... | ...... | 82.1 | 84.8 | 84.5 | 84.8 | 83.8 |
| Drugs & Pharmaceuticals* ... | ...... | 78.1 | 96.0 | 78.4 | 96.2 | 77.1 |
| Fert. mat.* .................. | ...... | 70.6 | 68.1 | 67.2 | 68.0 | 65.5 |
| Paint and paint mat. ........ | ...... | 85.7 | 84.1 | 84.7 | 84.2 | 82.1 |
| **FERTILIZER:** | | | | | | |
| *Exports* (long tons, Nat. Fert. Association) | | | | | | |
| Fertilizer and fert. materials ... | ...... | 112,699 | 144,348 | 123,792 | 178,474 | 141,171 |
| Total phosphate rock ........ | ...... | 58,402 | 82,336 | 58,113 | 120,635 | 98,580 |
| Total potash fertilizers ...... | ...... | 7,648 | 12,552 | 17,214 | 18,329 | 5,579 |
| *Imports* (long tons, Nat. Fert. Association) | | | | | | |
| Fertilizer and fert. materials ... | ...... | 112,411 | 68,128 | 87,434 | 87,749 | 75,485 |
| Sodium nitrate ............... | ...... | 42,204 | 37,610 | 10,445 | 52,703 | 9,481 |
| Total potash fertilizer ...... | ...... | 14,571 | 7,787 | 15,877 | 8,829 | 29,087 |

### INDUSTRIAL TRENDS




**Business:** Industrial activity continues to grow with indications now of levelling off and maintaining the high peak that has been reached. The New York Times Business Index during the week of November 23 reached the highest point in its history. It was 117.0 compared with previous high of 114.8 for week ended June 29, 1929. The Federal Reserve Board's Index of Industrial Production was set at 128 for October and will probably be considerably higher for November.

**Steel:** Steel ingot production has almost reached 97% of capacity. This is the fourth month over 90% level. In 1929 the monthly rate averaged 90% for eight consecutive months, from February to September, inclusive. It appears that if the present high rate continues for a few more months this all-high average will be surpassed. As fresh steel buying continues at pace substantially above rate of output and delivery dates continue to move backward, it appears very likely that this will happen. Demand continues strongest for shapes, plates, and bars, in that order.

**Electric Output:** Production of electricity by the electric light and power industry for week ended November 23 totaled 2,695,431,000 kilowatt hours, an increase of 8.6% over corresponding week a year ago. This compared with a gain of 9.4% in the preceding week. Best gains were shown in the Pacific states. The November 23 figure was about 2% under the all-time high set in week ended November 16, when total was 2,751,528 kwh.

**Carloadings:** Revenue freight car loadings in the week ended November 30 are estimated to be about 734,000

State of Chemical Trade
Current Statistics (Nov. 30, 1940)—p. 70

## State of Chemical Trade

**Current Statistics (Nov. 30, 1940)—p. 71**

cars compared with 733,488 cars in the previous week. This would compare with 689,000 cars in like 1939 period. During the past month there have been less than seasonal increases and in several weeks loadings failed to reach 1939 levels.

**Automotive:** Production is running high. In October 514,000 units were assembled as compared with 325,000 a year ago. November assemblies are estimated at a little above 500,000 against 369,000, the previous November high in 1939. Production schedules for December had been placed at about 400,000 units but have now been revised to 450,000.

This production would bring the fourth quarter total to around 1,465,000 units, or more than 25% above the previous peak for the period set last year. Factory sales in October amounted to 493,223 units. Indications point to another sizable gain during November with total likely to attain 540,000 units. The rise in inventories has been proportionate to the rise in sales. Inventories approximate 66% of a months supply at the October sales rate as compared with 58% a year ago.

**Textiles:** Mill sales of cotton goods have been large since the middle of August, reflecting increased civilian and military demand, and have been in excess of production during most of this period. At wool textile mills, where activity had risen sharply in September, there was a further increase in October. Backlogs of orders in this industry are now of considerable size, owing to large volume of orders received the past two months, particularly from the Government.

**Retail Trade:** Retail trade for November was sharply up from October. The Federal Reserve Board Index of department store sales for November is estimated at 102, ten points above the 92 of October. Sales toward the end of November were running about 12% ahead of the same period of 1939. The heaviest volume of buying continues to be reported from the industrial centers of the Midwest and South.

**Outlook:** Industrial production has reached capacity in many industries. It is likely that the production indexes will progress somewhat higher, not so much because of actual increased production but because of seasonal adjustments. There are some indications that industrial buying is not going ahead so rapidly now. However, Government expenditures and the results of increasing consumer purchasing power should hold production at high levels.

### MONTHLY STATISTICS (cont'd)

| FERTILIZER: (Cont'd) | Oct. 1940 | Oct. 1939 | Sept. 1940 | Sept. 1939 | Aug. 1940 | Aug. 1939 |
|---|---|---|---|---|---|---|
| *Superphosphate* e (Nat. Fert. Association) | | | | | | |
| Production, total | ...... | 350,396 | 278,103 | 273,378 | 303,393 | 231,128 |
| Shipments, total | ...... | 287,103 | 371,539 | 351,057 | 186,298 | 155,780 |
| Northern area | ...... | 160,357 | 292,234 | 281,374 | 118,613 | 104,123 |
| Southern area | ...... | 126,746 | 79,305 | 69,683 | 67,685 | 51,657 |
| Stocks, end of month, total | ...... | 1,266,029 | 1,275,841 | 1,151,976 | 1,348,226 | 1,197,822 |
| *Tag Sales* (short tons, Nat. Fert. Association) | | | | | | |
| Total, 17 states | 206,569 | 210,115 | 282,844 | 222,040 | 161,633 | 154,853 |
| Total, 12 southern | 188,799 | 190,065 | 142,636 | 154,413 | 60,782 | 42,992 |
| Total, 5 midwest | 17,770 | 20,050 | 100,208 | 67,627 | 100,851 | 111,861 |
| Fertilizer employment *i* | ...... | 103.3 | 96.8 | 98.4 | 81.4 | 73.9 |
| Fertilizer payrolls *i* | ...... | 101.3 | 85.8 | 86.3 | 71.2 | 62.7 |
| Value imports, fert. and mat. *d* | ...... | $2,536 | $1,424,649 | $181,461 | $1,703 | $1,711 |
| **GENERAL:** | | | | | | |
| Acceptances outst'd'g *f* | $186 | $221 | $176 | $215 | $181 | $235 |
| Coal prod., anthracite, tons | ...... | 4,557,000 | 4,053,000 | 4,840,000 | 3,775,000 | 3,832,000 |
| Coal prod., bituminous, tons | ...... | 41,574,000 | 38,413,000 | 38,465,000 | 39,240,000 | 34,688,000 |
| Com. paper outst'd'g *f* | $252 | $205 | $250 | $209 | $244 | $201 |
| Failures, Dun & Bradstreet | 1,111 | 1,234 | 976 | 1,043 | 1,128 | 1,126 |
| Factory payrolls *i* | ...... | 101.3 | 109.4 | 93.8 | 103.8 | 89.7 |
| Factory employment *i* | ...... | 103.3 | 107.2 | 100.2 | 103.6 | 96.3 |
| Merchandise imports *d* | $207,141 | $215,289 | $194,928 | $181,461 | $220,217 | $175,623 |
| Merchandise exports *d* | $343,485 | $331,978 | $295,245 | $288,573 | $349,800 | $250,102 |
| **GENERAL MANUFACTURING:** | | | | | | |
| Automotive production | 493,222 | 313,392 | 269,108 | 188,757 | 75,878 | 99,868 |
| Boot and shoe prod., pairs | 36,565,529 | 37,272,864 | 34,991,706 | 36,806,764 | 39,315,434 | 43,580,655 |
| Bldg. contracts, Dodge *j* | ...... | 261,796 | $347,651 | $323,227 | $414,941 | $312,328 |
| Newsprint prod., U. S. tons | 88,192 | 78,591 | 77,888 | 77,309 | 86,633 | 80,000 |
| Newsprint prod., Canada, tons. | 309,957 | 280,985 | 282,322 | 253,230 | 316,607 | 236,975 |
| Glass containers, gross‡ | ...... | 4,891 | 4,289 | 4,250 | 4,653 | 4,802 |
| Plate glass prod., sq. ft. | 17,070.3 | 18,368.9 | 14,090,796 | 13,662,855 | 12,533.4 | 10,450,000 |
| Window glass prod., boxes | ...... | 1,121,288 | 1,001,979 | 913,980 | 992,906 | 867,452 |
| Steel ingot prod., tons | 6,461,898 | 6,147,783 | 5,895,232 | 4,769,468 | 6,033,037 | 4,241,994 |
| % steel capacity | 96.10 | 89.75 | 90.75 | 72.87 | 89.72 | 62.62 |
| Pig iron prod., tons | 4,445,961 | 4,062,901 | 4,176,527 | 2,878,556 | 4,238,041 | 4,053,945 |
| U.S. cons'pt. crude rub., lg. tons | ...... | ...... | ...... | 50,150 | 50,477 | 51,740 |
| Tire shipments | 5,560,709 | 5,160,661 | 4,511,664 | 5,658,126 | 4,173,508 | 4,990,486 |
| Tire production | 5,081,939 | 5,391,815 | 4,416,587 | 5,076,280 | 4,621,223 | 5,510,819 |
| Tire inventories | 9,447,962 | 8,381,852 | 9,886,022 | 8,080,462 | 9,732,108 | 8,690,984 |
| Cotton consumpt., bales | ...... | 686,936 | 639,252 | 624,183 | 654,503 | 628,448 |
| Cotton spindles oper. | ...... | 22,658,994 | 22,278,204 | 22,231,496 | 22,078,162 | 22,009,882 |
| Silk deliveries, bales | 39,877 | 41,858 | 28,828 | 36,869 | 30,189 | 33,095 |
| Wool consumption *s* | ...... | 39.4 | 38.3 | 36.0 | 36.1 | 38.3 |
| Rayon deliv., lbs. | 36,900,000 | 34,800,000 | 30,900,000 | 32,800,000 | 35,400,000 | 31,300,000 |
| Rayon employment *i* | ...... | 310.8 | 311.9 | 300.2 | 307.7 | 255.1 |
| Rayon payrolls *i* | ...... | 303.4 | 324.4 | 286.4 | 318.0 | 246.6 |
| Soap employment *i* | ...... | 90.4 | 82.4 | 88.5 | 83.6 | 86.0 |
| Soap payrolls *i* | ...... | 109.0 | 107.1 | 107.1 | 101.8 | 102.3 |
| Paper and pulp employment *i* | ...... | 113.6 | 116.5 | 108.8 | 116.9 | 107.0 |
| Paper and pulp payrolls *i* | ...... | 125.6 | 123.7 | 113.4 | 124.8 | 107.7 |
| Leather employment *i* | ...... | 88.4 | 79.8 | 86.5 | 80.3 | 85.3 |
| Leather payrolls *i* | ...... | 88.2 | 76.8 | 84.2 | 77.0 | 83.1 |
| Glass employment *i* | ...... | 106.2 | 109.1 | 100.9 | 106.9 | 98.5 |
| Glass payrolls *i* | ...... | 121.2 | 119.7 | 105.0 | 116.0 | 102.5 |
| Rubber prod. employment *i* | ...... | 92.4 | 89.7 | 86.0 | 85.8 | 82.6 |
| Rubber prod. payrolls *i* | ...... | 101.9 | 96.0 | 91.0 | 87.8 | 86.3 |
| Dyeing and fin. employment *i* | ...... | 132.9 | 124.9 | 125.0 | 121.5 | 122.2 |
| Dyeing and fin. payrolls *i* | ...... | 115.5 | 106.5 | 107.7 | 101.8 | 103.3 |
| **MISCELLANEOUS:** | | | | | | |
| Oils & Fats Index (26=100)[1] | 48.7 | 62.5 | 49.3 | 67.0 | 48.6 | 48.1 |
| Gasoline prod. *p* | ...... | 54,974 | 52,658 | 51,890 | 52,658 | 46,899 |
| Cottonseed oil consumpt., bbls. | 315,764 | 358,122 | 276,731 | 444,743 | 288,390 | 305,000 |
| **PAINT, VARNISH, LACQUER, FILLERS:** | | | | | | |
| Sales 680 establishments | 39,179,174 | 35,827,911 | 35,327,356 | 38,579,427 | $36,441,511 | $34,448,630 |
| Trade sales (580 establishments) | 19,638,441 | 18,466,640 | 18,416,711 | 21,413,297 | $19,302,935 | $19,046,555 |
| Industrial sales, total | 15,953,121 | 14,007,459 | 13,458,969 | 13,381,467 | $13,651,210 | $12,153,308 |
| Paint & Varnish, employ. *i* | ...... | 125.1 | 126.2 | 122.1 | 123.5 | 122.1 |
| Paint & Varnish, payrolls *i* | ...... | 134.7 | 134.5 | 127.5 | 132.1 | 125.6 |

*a* Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940;

[1] Revised series beginning February, 1940.

## Union Carbide & Carbon Earning Up

High rate of operations in the steel industry, which is using more oxygen for processing and more ferro-alloys per ton of steel than ever before, increased third quarter profits of Union Carbide & Carbon Corp. to the best levels this year, in spite of excess profits taxes.

Net profit for the September quarter, after providing for excess profits taxes, was equal to $1.19 a share, against $1.02 a share in the June quarter after tax provisions, $1.13 in the March quarter, and 92 cents in the September quarter a year ago.

Net profit for the first nine months of this year totaled $3.34 a share. The final quarter is normally the largest, partly on account of heavy sales of Prestone, the automobile anti-freeze. Last year Carbide earned about $1.75 in the final quarter. In view of the present rate of earnings after taxes, the peak rate of operations, it would appear likely that the company should be able to earn at least $1.50 and probably more in the final quarter of this year.

On this basis, Carbide may be expected to earn in the neighborhood of $4.75 to $5 a share this year, which would be the best showing in the company's history, with the possible exception of 1937 when net was equal to $4.81 a share.

## Corn Products Refining Earns $2.28

Report of Corn Products Refining Co. and its subsidiary sales company for nine months ended September 30, 1940, subject to audit and year-end adjustment, shows net profit of $6,069,016 after depreciation, federal income taxes, including adjustment for federal taxes to new rate of 24% etc., equivalent after dividend requirements on 7% preferred stock, to $1.89 a share on 2,530,000 shares (par $25) of common stock.

This compares with $7,072,838 or $2.28 a share for the nine months ended September 30, 1939.

### Dividends and Dates

| *Name* | *Div.* | *Stock Record* | *Payable* |
|---|---|---|---|
| Abbott Laboratories, | | | |
| q. | 40c | Nov. 15 | Dec. 1 |
| extra | 25c | Dec. 5 | Dec. 23 |
| 4½% pf., q. | $1.125 | Dec. 5 | Dec. 23 |
| Amer. Smelting & Refining (spec.) | 75c | Dec. 6 | Dec. 27 |
| Pf. | $1.75 | Dec. 6 | Dec. 27 |
| Catalin Corp. of Amer. | 15c | Dec. 2 | Dec. 16 |
| Clorox Chem Co. q. | 75c | Dec. 10 | Dec. 20 |
| Commercial Solvents Corp. (resumed) | 25c | Dec. 6 | Dec. 23 |
| Dewey & Almy Chemical | 25c | Nov. 30 | Dec. 16 |
| Class B | 25c | Nov. 30 | Dec. 16 |
| Pf., q. | $1.25 | Nov. 30 | Dec. 16 |
| du Pont de Nemours & Co. (year-end) | $1.75 | Nov. 25 | Dec. 14 |
| $4.50 pf., q. | $1.125 | Jan. 10 | Jan. 25 |
| Durey Plastics & Chem. common | 50c | Nov. 18 | Dec. 1 |
| 7% pf. q. | $1.75 | Nov. 18 | Dec. 1 |
| 6% pf., q. | $.375 | Nov. 18 | Dec. 1 |
| Hercules Powder Co. (year-end) | $1.05 | Dec. 9 | Dec. 1 |
| National Lead Co. | | | |
| q. | $.125 | Dec. 6 | Dec. 23 |
| extra | $.375 | Dec. 6 | Dec. 23 |
| Pf., B, q. | $1.50 | Jan. 17 | Feb. 1 |
| New Jersey Zinc | 50c | Dec. 2 | Dec. 20 |
| Niagara Alkali pf., q. | $1.75 | Nov. 25 | Jan. 2 |
| Pennsylvania Salt Mfg. | $2.00 | Nov. 30 | Dec. 14 |
| Potash Co. of America | 25c | Dec. 14 | Jan. 2 |
| Squibb (E.R.) & Son | | | |
| $5 pf., q. | $1.25 | Jan. 15 | Feb. 1 |
| common (year-end) | $1.25 | Dec. 2 | Dec. 11 |

## Hercules Net Up Slightly

Report of Hercules Powder Co., Inc., for nine months ended September 30, 1940, shows net profit of $3,744,236 after federal taxes calculated at increased rates imposed under second revenue act of 1940, of $2,901,498, depreciation, etc., equal after preferred dividend requirements, to $2.54 a share on 1,316,710 shares of common stock.

This compares with $3,646,561 or $2.47 a common share in first nine months of 1939.

## Victor Chemical Earns $1.22

Victor Chemical Works reports for nine months ended September 30, 1940, net profit of $848,408 after charges and provision for income tax at increased rates now effective, but before provision for any excess profits tax, equal to $1.22 a share on 696,000 shares of capital stock. This compares with $735,784 or $1.06 a share in nine months ended September 30, 1939.

For quarter ended September 30, last, net profit was $362,563 or 52 cents a share as compared with $298,801 or 43 cents a share in September quarter of 1939 and $258,855 or 37 cents a share in quarter ended June 30, 1940.

### Earnings Statements Summarized

| Company: | Annual dividends | Net income 1940 | Net income 1939 | Common share earnings 1940 | Common share earnings 1939 | Surplus after dividends 1940 | Surplus after dividends 1939 |
|---|---|---|---|---|---|---|---|
| **American Commercial Alcohol:** | | | | | | | |
| Nine months, Sept. 30 | *f* | $108,968 | †$262,575 | $.42 | ... | ...... | ...... |
| **American Zinc Lead & Smelting Co.:** | | | | | | | |
| Sept. 30 quarter | *f* | 153,864 | 74,106 | .10 | *r*$1.11 | ...... | ...... |
| Nine months, Sept. 30 | *f* | 407,504 | 160,260 | .22 | *r*2.41 | ...... | ...... |
| Twelve months, Sept. 30 | *f*• | 566,877 | 182,860 | .33 | *r*2.75 | ...... | ...... |
| **Bristol-Meyers Co.:** | | | | | | | |
| September 30 quarter | *y*$2.55 | 831,298 | 625,159 | 1.22 | .92 | ...... | ...... |
| Nine months, Sept. 30 | *y* 2.55 | 1.974,137 | 1,943,859 | 2.89 | 2.85 | ...... | ...... |
| Twelve months, Sept. 30 | *y* 2.55 | 2,410.062 | 2,357,184 | 3.53 | 3.46 | ...... | ...... |
| **Celanese Corp. of America:** | | | | | | | |
| Sept. 30 quarter | *x* 1.25 | 2,085,010 | 1,234,035 | *h*1.24 | *h*.62 | ...... | ...... |
| Nine months, Sept. 30 | *x* 1.25 | 6,607,590 | 4,261,809 | *h*4.01 | *h*2.35 | ...... | ...... |
| Twelve months, Sept. 30 | *x* 1.25 | 8,719,881 | 4,876,134 | *h*5.28 | *h*2.41 | ...... | ...... |
| **Columbian Carbon Co.:** | | | | | | | |
| Nine months, Sept. 30 | *y* 4.60 | 2,418,199 | 2,380,330 | 4.50 | 4.43 | $805,981 | $768,112 |
| **Interchemical Corp.:** | | | | | | | |
| Nine months, Sept. 30 | *y* 1.60 | 782,097 | 1,022,020 | 1.68 | 2.51 | 140,461 | 612,089 |
| Twelve months, Sept. 30 | *y* 1.60 | 1,342,038 | 1,234,505 | 3.27 | 2.91 | ...... | ...... |
| **International Nickel Co.:** | | | | | | | |
| Sept. 30 quarter | *y* 2.00 | 8,364,811 | 8,811,368 | .54 | .57 | 592,252 | 1,038,809 |
| Nine months, Sept. 30 | *y* 2.00 | 26,425,104 | 26,584,806 | 1.71 | 1.72 | 3,107,426 | 3,267,129 |
| **National Oil Products Co.:** | | | | | | | |
| Nine months, Sept. 30 | *y* 1.85 | 527,277 | 499,289 | 2.93 | 2.78 | ...... | ...... |
| **United Carbon Co.:** | | | | | | | |
| Nine months, Sept. 30 | *y* 3.00 | 1,078,707 | 1,107,715 | 2.71 | 2.78 | 183,466 | 212,474 |
| **United Chemicals, Inc.:** | | | | | | | |
| Nine months, Sept. 30 | *f* | 130,166 | 166,851 | ... | ... | ...... | ...... |
| **U. S. Smelting, Refining & Mining Co.:** | | | | | | | |
| Ten months, Oct. 31 | 6.00 | 4,568,499 | 4,250,625 | 6.06 | 5.46 | ...... | ...... |
| **Vick Chemical Co.:** | | | | | | | |
| Sept. 30 quarter | *y* 3.00 | 1,044,247 | 1,071,939 | 1.52 | 1.53 | ...... | ...... |

*a* On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *p* On preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods. ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available. ¶¶ Before interest on income notes. *x* paid on or declared in last 12 months plus extra stock.

### Price Trend of Representative Chemical Company Stocks

| | Nov. 2 | Nov. 9 | Nov. 16 | Nov. 23 | Net gain or loss last mo. | Price on Nov. 25, 1939 | 1940 High | 1940 Low |
|---|---|---|---|---|---|---|---|---|
| Air Reduction Co. | 42½ | 43¾ | 41½ | 40⅞ | —1⅝ | 56 | 58⅛ | 36½ |
| Allied Chemical & Dye | 171 | 173½ | 170 | 167¾ | —3¼ | 173 | 182 | 135½ |
| Amer. Agric. Chem. | 15¼ | 16¾ | 17 | 15¾ | + ½ | 31⅜ | 21 | 12⅛ |
| Amer. Cyanamid "B" | 36 | 36⅜ | 35⅝ | 34¾ | —1¼ | 20 | 39⅞ | 26 |
| Columbian Carbon | 81 | 82 | 80 | 79½ | —1½ | 91½ | 98¾ | 71 |
| Commercial Solvents | 10⅜ | 10⅞ | 10⅞ | 10½ | + ⅛ | 13 | 16⅝ | 8 |
| Dow Chemical Co. | 141½ | 140 | 138 | 133 | —8½ | 135 | 171 | 133 |
| du Pont de Nemours | 170 | 170⅞ | 165¼ | 156⅞ | —13⅛ | 177 | 189¼ | 146½ |
| Hercules Powder | 76½ | 75½ | 74 | 72 | —4½ | 87½ | 100½ | 70 |
| Mathieson Alkali | 32 | 31⅜ | 30½ | 29 | —3 | 29 | 32¾ | 21 |
| Monsanto Chem. Co. | 86 | 84 | 82 | 80 | —6 | 105½ | 119 | 79 |
| Standard Oil of N. J. | 35⅛ | 36½ | 36½ | 35 | — ⅛ | 45¾ | 46½ | 29⅞ |
| Texas Gulf Sulphur | 35 | 36¾ | 37 | 37 | +2 | 34½ | 35¾ | 26⅞ |
| Union Carbide & Carbon | 75¾ | 75⅞ | 74 | 71¼ | —4½ | 86½ | 88⅜ | 59⅞ |
| U. S. Industrial Alcohol | 22¾ | 24 | 22¾ | 23⅜ | + ⅝ | 21¼ | 28 | 14 |

Chemical Finances
November, 1940—p. 70

**Chemical Finances**
November, 1940—p. 71

# Chemical Stocks and Bonds

| Nov. 1940 Last | High | Low | 1939 High | 1939 Low | 1938 High | 1938 Low | Sales Nov. 1940 (Number of shares) | Sales 1940 | Stocks | Par $ | Shares Listed | Dividends | Earnings** $-per-share-$ 1939 | 1938 | 1937 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NEW YORK STOCK EXCHANGE** | | | | | | | | | | | | | | | |
| 54 | 70¼ | 50 | 71½ | 53 | 61 | 46¾ | 9,100 | 46,200 | Abbott Labs. | No | 752,468 | $2.05 | 2.61 | 2.43 | 2.51 |
| 41⅞ | 58⅛ | 36½ | 68 | 45¼ | 67⅞ | 40 | 53,000 | 335,100 | Air Reduction | No | 2,563,992 | 1.50 | 1.98 | 1.47 | 2.86 |
| 167½ | 182 | 135½ | 200½ | 151½ | 197 | 124 | 15,500 | 129,000 | Allied Chem & Dye | No | 2,214,099 | 9.00 | 9.50 | 5.92 | 11.19 |
| 16 | 21 | 12⅛ | 24½ | 16 | 28½ | 22 | 11,800 | 47,700 | Amer. Agric. Chem | No | 627,987 | 1.30 | 1.22 | 2.23 | 2.95 |
| 5¼ | 8¼ | 4⅛ | 11⅞ | 5½ | 15 | 9 | 7,200 | 58,200 | Amer. Com. Alcohol | No | 280,934 | .... | —.40 | —2.05 | 3.23 |
| 33 | 35½ | 23 | 37 | 21 | 31½ | 20 | 2,300 | 22,100 | Archer-Dan.-Midland | No | 545,416 | 1.10 | 3.02 | .43 | 5.03 |
| 74 | 80½ | 57 | 71 | 50 | 68 | 36 | 2,700 | 19,000 | Atlas Powder Co. | No | 250,288 | 3.00 | 3.82 | 2.69 | 4.40 |
| 119¼ | 124¾ | 112½ | 127 | 116 | 126¼ | 105 | 370 | 5,330 | 5% conv. cum. pfd. | 100 | 68,597 | 5.00 | 18.94 | 14.77 | 20.90 |
| 28¼ | 35½ | 20 | 30¼ | 13⅝ | 26⅝ | 9 | 41,400 | 683,600 | Celanese Corp. Amer. | No | 1,000,000 | .50 | 3.53 | .36 | 2.04 |
| 119½ | 119¾ | 105½ | 109⅞ | 84 | 96 | 82 | 2,370 | 29,240 | prior pfd | 100 | 164,818 | 7.00 | 37.72 | 15.05 | 27.07 |
| 11½ | 20 | 10½ | 18 | 11½ | 17 | 7⅛ | 23,500 | 323,200 | Colgate-Palm.-Peet | No | 1,962,087 | 1.00 | 2.74 | 1.77 | —.35 |
| 75 | 98¾ | 71 | 96 | 73 | 98½ | 53⅜ | 3,600 | 29,100 | Columbian Carbon | No | 537,406 | 4.50 | 5.32 | 5.13 | 8.31 |
| 10½ | 16⅝ | 8 | 16 | 8⅝ | 12¼ | 5⅞ | 69,500 | 843,700 | Commercial Solvents | No | 2,636,878 | .... | .61 | —.11 | .60 |
| 42¼ | 65⅛ | 41⅛ | 67½ | 54⅞ | 70¾ | 53 | 34,000 | 190,700 | Corn Products | 25 | 2,530,000 | 3.00 | 3.32 | 3.18 | 2.52 |
| 179 | 179 | 165 | 177 | 150 | 177 | 162 | 700 | 6,400 | 7% cum. pfd. | 100 | 245,738 | 7.00 | 41.18 | 39.69 | 32.96 |
| 14⅛ | 23¼ | 12½ | 32⅝ | 18 | 40⅞ | 25 | 2,360 | 26,220 | Devoe & Rayn. A. | No | 95,000 | .... | 2.05 | —1.72 | 4.05 |
| 130⅛ | 171 | 127¼ | 144⅝ | 101½ | 141 | 87⅞ | 15,000 | 123,600 | Dow Chemical | No | 1,034,988 | 3.00 | 3.76 | 3.91 | 4.15 |
| 157¼ | 189¼ | 146½ | 188½ | 126¼ | 154¾ | 90½ | 45,600 | 384,000 | DuPont de Nemours | 20 | 11,065,762 | 7.00 | 7.70 | 3.74 | 7.37 |
| 129 | 129 | 114 | 124⅛ | 112 | 120½ | 109½ | 3,800 | 51,850 | 4½% pfd. | No | 1,688,850 | 4.50 | 52.25 | 57.27 | 165.48 |
| 144 | 166¾ | 117 | 186⅛ | 138⅛ | 187 | 121½ | 16,900 | 159,400 | Eastman Kodak | No | 2,476,013 | 6.00 | 8.55 | 7.54 | 9.76 |
| 177 | 178 | 155 | 183½ | 155½ | 173 | 157 | 170 | 1,780 | 6% cum. | 100 | 61,657 | 6.00 | 349.31 | 261.22 | 362.45 |
| 36⅞ | 38¾ | 24¾ | 36 | 18¼ | 32 | 19⅞ | 24,400 | 194,300 | Freeport Sulphur | 10 | 796,380 | 1.50 | 2.76 | 1.87 | 3.30 |
| 6⅞ | 10 | 5½ | 10⅞ | 7 | 12⅛ | 6¾ | 7,000 | 45,800 | Gen. Printing Ink | 1 | 735,960 | .80 | .94 | .62 | 1.32 |
| 14½ | 19¾ | 11 | 24½ | 14 | 28½ | 13 | 8,400 | 98,100 | Glidden Co. | No | 829,989 | .50 | 1.70 | —.29 | 2.62 |
| 44 | 44⅝ | 30 | 47 | 34 | 51½ | 37 | 1,700 | 9,000 | 4½% cum. pfd. | 50 | 199,940 | 2.25 | 4.27 | 1.08 | 12.72 |
| 96 | 113¼ | 89⅞ | 112¼ | 93 | 111 | 76¾ | 2,800 | 18,900 | Hazel Atlas | 25 | 434,409 | 5.00 | 6.64 | 4.97 | 6.67 |
| 72⅞ | 100½ | 70 | 101½ | 63 | 87 | 42¾ | 10,200 | 91,100 | Hercules Powder | No | 1,316,710 | 2.85 | 3.65 | 1.95 | 2.97 |
| 128½ | 133½ | 126¼ | 135½ | 128½ | 135¼ | 126¾ | 420 | 5,100 | 6% cum. pfd. | 100 | 96,194 | 6.00 | 60.87 | 35.31 | 50.75 |
| 24¼ | 29 | 16⅜ | 29½ | 16¾ | 30⅝ | 14⅝ | 8,200 | 79,500 | Industrial Rayon | No | 759,325 | .75 | 1.77 | .24 | .34 |
| 23 | 47⅜ | 21¼ | 46¼ | 17½ | 34½ | 15 | 3,000 | 59,600 | Interchem. | No | 290,320 | .40 | 4.10 | .32 | 1.44 |
| 111½ | 113 | 91 | 109½ | 90 | 98 | 80 | 780 | 5,870 | 6% pfd. | 100 | 65,661 | 6.00 | 24.27 | 7.39 | 12.28 |
| 2 | 2⅝ | 1 | 3⅝ | 1⅛ | 3⅞ | 2 | 6,100 | 56,800 | Intern. Agricul. | No | 436,048 | .... | —1.32 | —0.003 | .16 |
| 32½ | 38 | 18⅛ | 41 | 16 | 29 | 15 | 3,500 | 18,600 | 7% cum. pfd. | 100 | 100,000 | .... | 1.26 | 7.01 | 7.70 |
| 24⅛ | 38⅞ | 19⅜ | 55¾ | 35 | 57⅝ | 36⅞ | 105,900 | 898,400 | Intern. Nickel | No | 14,584,025 | 2.00 | 2.39 | 2.09 | 3.31 |
| 38 | 38 | 26⅞ | 38 | 29 | 30¼ | 19½ | 2,000 | 14,700 | Intern. Salt | No | 240,000 | 1.75 | 1.92 | 2.29 | 2.11 |
| 20¾ | 23¾ | 14⅝ | 22½ | 14½ | 24 | 19⅛ | 500 | 15,300 | Kellogg (Spencer) | No | 509,213 | 1.10 | 1.39 | .71 | 2.81 |
| 44⅛ | 53⅜ | 30 | 56¾ | 36½ | 58⅝ | 23¼ | 26,800 | 196,100 | Libbey Owens Ford | No | 2,513,258 | 2.75 | 3.21 | 1.57 | 4.19 |
| 17 | 18⅝ | 10⅛ | 19 | 13½ | 21½ | 12⅛ | 7,700 | 88,300 | Liquid Carbonic | No | 700,000 | 1.00 | 1.62 | 1.81 | 2.37 |
| 28¾ | 32¾ | 21 | 37⅜ | 20⅝ | 36⅞ | 19⅝ | 10,400 | 101,600 | Mathieson Alkali | No | 828,171 | 1.50 | 1.12 | 1.01 | 1.81 |
| 81⅞ | 119 | 79 | 114¾ | 85⅝ | 110 | 67 | 25,900 | 149,400 | Monsanto Chem. | No | 1,241,816 | 3.00 | 4.01 | 2.35 | 4.49 |
| 115½ | 119 | 110 | 121 | 110 | 117½ | 111 | 630 | 3,500 | 4½% pfd. A. | No | 50,000 | 4.50 | 54.29 | 31.51 | 49.99 |
| 119¼ | 122 | 113½ | 122½ | 112 | ... | ... | 460 | 3,330 | 4½% pfd. B. | No | 50,000 | 4.50 | 54.29 | 31.51 | 49.99 |
| 17⅞ | 22½ | 14⅛ | 27½ | 17⅞ | 31 | 17⅛ | 54,400 | 287,600 | National Lead | 10 | 3,095,100 | .87 | 1.28 | .75 | .95 |
| 171 | 173⅜ | 160 | 173⅛ | 152 | 178½ | 154 | 400 | 4,700 | 7% cum. "A" pfd. | 100 | 213,793 | 7.00 | 27.04 | 20.03 | 22.86 |
| 146 | 148½ | 132 | 145 | 132 | 145½ | 127 | 840 | 4,160 | 6% cum. "B" pfd. | 100 | 103,277 | 6.00 | 55.30 | 35.97 | 43.77 |
| 8⅞ | 14¼ | 6⅛ | 17⅜ | 8½ | 19½ | 9⅞ | 37,400 | 217,400 | Newport Industries | 1 | 620,459 | .... | .66 | —.08 | 2.22 |
| 47½ | 64⅝ | 42 | 70 | 50 | 76¼ | 40 | 21,400 | 146,300 | Owens-Illinois Glass | 12.50 | 2,661,204 | 2.00 | 3.17 | 2.02 | 3.51 |
| 55½ | 71¾ | 53 | 66 | 50⅝ | 59 | 39½ | 27,700 | 211,600 | Procter & Gamble | No | 6,325,087 | 2.25 | 3.80 | 2.50 | 4.03 |
| 118 | 118½ | 112½ | 119⅜ | 112 | 122¼ | 114 | 700 | 8,270 | 5% pfd. | 100 | 169,517 | 5.00 | 298.55 | 101.81 | 157.05 |
| 10¼ | 13⅛ | 7⅝ | 17¼ | 9⅞ | 18⅝ | 10 | 26,300 | 194,200 | Shell Union Oil | No | 13,070,625 | .50 | .77 | .70 | 1.44 |
| 106½ | 108¼ | 95⅛ | 107⅞ | 98½ | 106½ | 93 | 1,200 | 15,500 | 5½ cum. pfd. | 100 | 341,000 | 5.50 | 34.61 | 33.18 | 60.59 |
| 20⅛ | 23¼ | 12¼ | 29½ | 15½ | 34⅝ | 18½ | 9,100 | 75,400 | Skelly Oil | No | 995,349 | .75 | 1.99 | 2.27 | 6.07 |
| 26 | 29 | 20⅝ | 30 | 22⅝ | 35½ | 24⅝ | 85,500 | 561,600 | S. O. Indiana | 25 | 15,272,020 | 1.25 | 2.24 | 1.82 | 3.16 |
| 34⅜ | 46½ | 29⅞ | 53⅛ | 38 | 58⅝ | 39⅝ | 137,500 | 1,080,000 | S. O. New Jersey | 25 | 26,618,065 | 1.25 | 3.27 | 2.86 | 5.64 |
| 7¾ | 8½ | 4¼ | 9⅛ | 4 | 8 | 3⅞ | 20,500 | 107,900 | Tenn. Corp. | 5 | 853,696 | .... | .41 | .46 | 1.09 |
| 38⅛ | 47⅝ | 33 | 50⅝ | 32½ | 49⅝ | 37⅝ | 89,900 | 719,700 | Texas Corp. | 25 | 10,876,882 | 2.00 | 3.02 | 2.13 | 5.02 |
| 36¼ | 37¼ | 26⅞ | 38½ | 26 | 38 | 26 | 29,100 | 190,000 | Texas Gulf Sulphur | No | 3,840,000 | 2.00 | 2.04 | 1.81 | 3.03 |
| 71 | 88⅜ | 59⅞ | 94¼ | 65½ | 90⅞ | 57 | 74,400 | 483,400 | Union Carbide & Carbon | No | 9,277,288 | 1.90 | 3.86 | 2.77 | 4.81 |
| 52 | 65⅝ | 42½ | 69½ | 52 | 73½ | 39 | 3,800 | 43,000 | United Carbon | No | 397,885 | 3.00 | 3.81 | 3.78 | 5.91 |
| 21 | 28 | 14 | 29⅝ | 13½ | 30¼ | 13½ | 6,700 | 115,800 | U. S. Indus. Alcohol | No | 391,238 | .... | .20 | —1.08 | 1.24 |
| 33¾ | 43⅞ | 25 | 40 | 16 | 28⅞ | 11½ | 61,100 | 567,900 | Vanadium Corp. Amer. | No | 377,140 | 1.00 | 3.25 | .61 | 2.22 |
| 25 | 31½ | 19 | 29⅝ | 18¼ | 25¼ | 13½ | 3,300 | 35,100 | Victor Chem. | 5 | 696,000 | 1.40 | 1.59 | 1.05 | 1.01 |
| 2¼ | 4⅛ | 1¾ | 5⅝ | 2½ | 5⅝ | 2⅝ | 6,200 | 60,700 | Virginia-Caro. Chem. | No | 486,122 | .... | —1.57 | —1.80 | —.05 |
| 23 | 31⅝ | 14 | 33⅝ | 17 | 32¼ | 15⅝ | 9,900 | 56,000 | 6% cum. part. pfd. | 100 | 213,052 | .... | 2.41 | 1.90 | 5.88 |
| 35 | 38½ | 27¾ | 39¼ | 15¼ | 20⅛ | 10 | 6,000 | 49,300 | Westvaco Chlorine | No | 339,362 | 1.85 | 2.81 | 1.52 | 1.46 |
| 33⅛ | 39¼ | 28⅞ | 39½ | 29 | 31½ | 20 | 20,600 | 72,800 | cum. pfd. | 30 | 192,000 | 1.50 | 6.64 | 4.19 | 4.09 |
| **NEW YORK STOCK EXCHANGE** | | | | | | | | | | | | | | | |
| 35⅝ | 39⅞ | 26 | 35⅝ | 18⅝ | 30¼ | 15½ | 64,000 | 539,400 | Amer. Cyanamid "B" | 10 | 2,618,387 | .60 | 2.07 | .91 | 2.09 |
| 130 | 132 | 98 | 112¾ | 76 | 92 | 50 | 2,300 | 23,850 | Celanese. 7% cum. 1st pfd. | 100 | 148,179 | 7.19 | 34.17 | 8.95 | 22.32 |
| 5½ | 6¾ | 2⅜ | 6¾ | 3 | 6¾ | 3 | 4,800 | 17,600 | Celluloid Corp. | 15 | 194,952 | .... | —.70 | —2.73 | —.93 |
| 3 | 7¾ | 2¾ | 7⅝ | 4½ | 12 | 6½ | ...... | 1,100 | Courtauld's Ltd. | £1 | 24,000,000 | .13 | 4.92% | .20% | 5.64% |
| 7⅞ | 8⅛ | 5 | 9¼ | 5 | 9⅞ | 6 | 2,300 | 19,200 | Duval Texas Sulphur | No | 500,000 | .... | 1.25 | .71 | .43 |
| 70 | 92 | 60 | 68 | 30 | 41¼ | 27 | 1,650 | 17,800 | Heyden Chem. Corp. | 100 | 125,497 | 2.00 | 5.98 | 2.07 | 3.94 |
| 96½ | 104 | 65 | 117 | 90 | 115½ | 55 | 8,000 | 61,500 | Pittsburgh Plate Glass | 25 | 2,192,824 | 4.00 | 4.94 | 3.00 | 8.53 |
| 75½ | 100 | 62½ | 113¼ | 81 | 117⅝ | 66 | 3,700 | 45,050 | Sherwin Williams | 25 | 638,927 | 2.75 | 5.90 | 2.43 | 8.76 |
| 114 | 114⅝ | 106 | 116 | 106½ | 114⅛ | 107 | 140 | 3,020 | 5% cum. pfd. | 50 | 132,189 | 5.00 | 35.08 | 8.76 | 45.50 |
| **PHILADELPHIA STOCK EXCHANGE** | | | | | | | | | | | | | | | |
| 184 | 192 | 158¾ | 179 | 135 | 167 | 121½ | 475 | 3,635 | Pennsylvania Salt | 50 | 150,000 | 6.00 | 10.52 | 6.29 | 11.79 |

| Nov. 1940 Last | High | Low | 1939 High | 1939 Low | 1938 High | 1938 Low | Sales Nov. 1940 | Sales 1940 | Bonds | Date Due | Int. % | Int. Period | Outstanding $ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NEW YORK STOCK EXCHANGE** | | | | | | | | | | | | | |
| 104⅛ | 105¼ | 100⅛ | 103⅜ | 98 | 105⅝ | 99¾ | 234,000 | 2,189,000 | Amer. I. G. Chem. Conv. | 1949 | 5½ | M-N | $22,400,000 |
| 33¾ | 41 | 27½ | 41½ | 19 | 38 | 25⅛ | 45,000 | 917,000 | Anglo Chilean Nitrate inc. deb. | 1967 | 4½ | J | 10,400,000 |
| 105 3/32 | 106⅞ | 100 | 102½ | 90 | 94 | 93 | 140,000 | 1,283,000 | Industrial Rayon | 1948 | 4½ | J-J | 7,100,000 |
| 30½ | 39⅝ | 27 | 37 | 21⅛ | 35⅜ | 24⅜ | 102,000 | 1,516,000 | Lautaro Nitrate inc. deb. | 1975 | 4 | J-D | 27,200,000 |
| 21 | 21 | 21 | 30 | 16 | 35⅜ | 24⅜ | ...... | 8,000 | Ruhr Chem. | 1948 | 6 | A-O | 1,500,000 |
| 99⅜ | 100 | 93½ | 95⅜ | 88⅜ | ... | ... | 869,000 | 7,398,000 | Shell Union Oil | 1954 | 3½ | J-J | 85,000,000 |
| 106⅝ | 107 | 101⅛ | 106⅛ | 97⅝ | 105⅝ | 100 | 265,000 | 2,674,000 | Standard Oil Co. (New Jersey) deb. | 1961 | 3 | J-D | 85,000,000 |
| 106⅛ | 107 | 100⅝ | 106⅛ | 94¼ | 103 | 98 | 191,000 | 2,585,000 | Standard Oil Co. (New Jersey) deb. | 1953 | 2¾ | J-J | 50,000,000 |
| 107⅞ | 108¼ | 102 | 105⅞ | 95¼ | ... | ... | 129,000 | 3,021,000 | Texas Corp. | 1959 | 3 | A-O | 40,000,000 |

** For either fiscal or calendar year.

## Synthetic Organic Chemicals, 1939

*(Taken from U. S. Tariff Commission Report No. 140, Second Series.)*

The United States Tariff Commission's twenty-third annual report on the production and sales of synthetic organic chemicals in the United States includes all synthetic organic chemicals grouped under the following classifications: Coal-tar crudes, intermediates, dyes, color lakes, and toners; coal-tar and non-coal-tar medicinals, flavors, and perfume materials, resins, rubber chemicals, and miscellaneous chemicals. In this issue we give the general summary for 1939 and the production and sales of coal-tar crudes.

### SUMMARY, 1939

Activity in the synthetic organic chemical industry, as a whole, increased sharply in 1939 over 1938, and exceeded that in the previous peak year, 1937.

The acceleration in the rate of coke-oven operations resulted in an increase of almost a third in coal-tar production. Greater market demand caused increased production of crude products from tar. The output of toluene or toluol, the raw material for the military explosive, trinitrotoluene, commonly called T. N. T. was the highest on record.

The production of coal tar, and the production and sales of crudes produced in large volume are shown in Table 1 for the years 1939, 1938, 1937, 1936, and the average for the period 1925-30.

The combined sales of all synthetic organic chemicals in 1939 were valued at $384,343,000, and not only exceeded by 39 per cent. those in 1938, a year of poor chemical sales, but surpassed the value of sales in any preceding year. The increase in sales value of coal-tar chemicals over 1938 was 42 per cent., or from $130,462,000 to $184,645,000, and in non-coal-tar synthetic organic chemicals 36 per cent., or from $146,435,000 to $199,698,000. The groups showing the largest percentage increase in sales value were intermediates, medicinals, and synthetic resins. The peak activity in synthetic organic chemicals in 1939 resulted from improved business conditions, a building up of inventories by both producers and consumers, and increased exports in the last quarter, particularly to countries whose imports of synthetic chemicals formerly came chiefly from the European belligerents. Although official export statistics do not give a total for all synthetic organic chemicals, it is known that exports of these synthetic products advanced considerably in 1939. The value of exports of all coal-tar chemicals was $9,891,000 in 1938 and $14,612,000 in 1939.

No significant increases in unit values of sales of synthetic organic chemicals occurred in 1939. Virtually all important raw materials for synthetic organic chemicals are abundant in the United States and in general have not advanced in price.

In 1939 a large part of the output of synthetic organic chemicals was consumed, as in preceding years, by producers in the manufacture of other chemicals. More than half of the coal-tar intermediates and of miscellaneous non-coal-tar chemicals, as well as smaller fractions of some of the other groups, was thus consumed by the producing companies. Accordingly the quantity of production is in excess of the quantity of sales in some group totals and in many individual commodities appearing in the tables in this report.

Each product reported by the manufacturers is listed in the detailed tables shown in this report. Statistics of production and sales are given for as many separate chemicals as is possible without disclosing information concerning the operations of individual companies. The Commission withholds statistics for a product or a group of products unless at least three firms report, and unless the total production and sales are well distributed among the three or more firms. In nearly all instances the absence of numerical data indicated by a blank in the detailed tabulations is not because of a lack of production or sales figures, but because these data are confidential. All such figures, however, are included in their respective group totals.

Sales statistics given in the tables are intended to reflect only sales of chemicals produced by the seller. Every effort has been made to eliminate resales of purchased merchandise and intercompany transfers.

Group totals for 1939 are comparable with those for 1938 except in one instance. The total of non-coal-tar rubber chem-

**Table 4.—Synthetic organic chemicals of non-coal-tar origin: Summary of United States production and sales, 1939.**

[Production and sales in thousands of pounds, value in thousands of dollars.]

| Product | Number of manufacturers | Production | Sales: Quantity | Sales: Value | Sales: Value per pound |
|---|---|---|---|---|---|
| Medicinals | 39 | 1,668 | 1,483 | 6,120 | $4.13 |
| Flavors and perfume materials | 30 | 2,137 | 2,233 | 1,588 | .71 |
| Resins | 19 | 33,690 | 34,877 | 15,983 | .46 |
| Rubber chemicals | 8 | 13,122 | 11,896 | 3,086 | .26 |
| Miscellaneous | 89 | 2,984,038 | 1,481,874 | 172,921 | .12 |
| Total | | 3,034,655 | 1,532,363 | 199,698 | .13 |

**Table 1.—Comparison of United States production of tar and production and sales of certain crudes, average 1925-30, annual 1936-39.**

[Production and sales in thousands of gallons, value in thousands of dollars.]

| Product | Average, 1925-30 | 1936 | 1937 | 1938 | 1939 | Increase, 1939 over 1938 Per cent. |
|---|---|---|---|---|---|---|
| Tar produced | 630,536 | 560,386 | 603,053 | 419,580 | 554,406 | 32.1 |
| Benzol: | | | | | | |
| Production | 22,257 | 19,413 | 26,795 | 17,745 | 30,470 | 71.7 |
| Sales | 22,257 | 19,145 | 22,141 | 17,176 | 26,628 | 55.0 |
| Sales value | 4,651 | 2,676 | 2,928 | 2,317 | 3,618 | 56.2 |
| Motor benzol: | | | | | | |
| Production | 96,879 | 85,673 | 95,527 | 61,903 | 86,246 | 39.3 |
| Sales | 96,879 | 84,762 | 93,767 | 61,221 | 81,672 | 33.4 |
| Sales value | 15,920 | 7,629 | 8,385 | 6,064 | 7,679 | 26.6 |
| Naphthalene: | | | | | | |
| Production[1] | 44,762 | 89,536 | 115,979 | 53,584 | 104,086 | 94.2 |
| Sales[1] | 44,762 | 74,054 | 109,394 | 50,693 | 87,837 | 73.3 |
| Sales value | 581 | 1,466 | 2,535 | 979 | 1,517 | 55.0 |
| Creosote oil: | | | | | | |
| Production | 95,443 | 101,758 | 107,294 | 88,067 | 110,242 | 25.2 |
| Sales | 95,443 | 93,216 | 107,485 | 88,713 | 101,487 | 14.4 |
| Sales value | 11,742 | 10,294 | 12,472 | 10,820 | 12,385 | 14.5 |

[1] Thousands of pounds.

Source: Compiled from data reported to the Tariff Commission and to the Bureau of Mines.

**Table 2.—Intermediates, dyes, and other coal-tar chemicals: Summary of United States production and sales, 1939.**

[Production and sales in thousands of pounds, value in thousands of dollars.]

| Product | Number of manufacturers | Production | Sales: Quantity | Sales: Value | Sales: Value per pound |
|---|---|---|---|---|---|
| Intermediates | 63 | 607,175 | 269,084 | 38,489 | $0.14 |
| Finished products, total | 221 | 437,867 | 353,604 | 146,156 | .41 |
| Dyes: | | | | | |
| Classified | | 99,564 | 95;074 | 48,018 | .50 |
| Unclassified | | 20,627 | 19,420 | 22,206 | 1.14 |
| Total | 43 | 120,191 | 114,494 | 70,224 | .61 |
| Color lakes and toners | 48 | 18,154 | 15,577 | 11,785 | .76 |
| Medicinals | 44 | 15,188 | 12,932 | 13,711 | 1.06 |
| Flavors and perfume materials | 30 | 5,349 | 4,938 | 4,447 | .90 |
| Resins | 64 | 179,338 | 128,420 | 23,028 | .18 |
| Rubber chemicals | 10 | 29,966 | 20,965 | 10,081 | .48 |
| Miscellaneous[1] | 51 | 69,681 | 56,278 | 12,880 | .23 |

[1] Includes benzoate of ammonia, benzoate of soda, benzoyl peroxide, biological stains and chemical indicators, poisonous and tear gases, synthetic insecticides, photographic chemicals, plasticizers, synthetic tanning materials, textile chemicals, and others.

Synthetic Organic Chemicals, 1939
Summary, Production, Sales—p. 5

## Synthetic Organic Chemicals, 1939

**Summary, Production, Sales—p. 6**

icals, heretofore included under the total of the miscellaneous chemicals group, is shown separately in 1939. This change, however, is a minor one and does not affect appreciably the miscellaneous non-coal-tar chemicals total for comparative purposes.

The production and sales of intermediates and finished coal-tar products in 1939 are summarized in Table 2, and a comparison of production and sales in 1939 with 1938, 1937, and 1936, and with the 1925-30 average is shown in Table 3.

The production and sales in 1939 of the several groups of synthetic organic chemicals not of coal-tar origin are shown in Table 4. The bulk of such chemicals are solvents and other industrial chemicals classified as miscellaneous. In Table 5 production and sales of all non-coal-tar synthetic organic chemicals in 1939 are compared with those in 1938, 1937, and 1936, and with the average for 1925-30.

### PRODUCTION AND SALES BY GROUPS, 1939

**Coal-Tar Crudes:**

An upswing in coke oven operations resulted in an increase in the production of coal tar from 419,580,000 gallons in 1938 to 554,406,000 gallons in 1939. Sixty-two per cent. of the output was sold in 1939 in comparison with 72 per cent. in 1938. Tar distilled by purchasers thereof in 1939 amounted to 334,871,000 gallons, or 17 per cent. more than in the preceding year.

Total production of toluene increased from 16,090,000 gallons in 1938 to 24,355,000 gallons in 1939. No toluene of nitration grade was produced commercially from petroleum in 1939. A solvent, however, containing approximately 50 per cent. toluene was produced in substantial quantities by two oil companies. Figures for this product are not included in this report.

The output of crude naphthalene increased 94 per cent. to 104,086,000 pounds, and the production of creosote oil advanced 25 per cent. to 110,242,000 gallons. Increased demands, particularly from synthetic resin manufacturers, were responsible for an increase in the recovery of crude cresylic acid and other crude tar acids. For the first time, one company reported cresylic acid produced in conjunction with petroleum refining.

Statistics of domestic production and sales of coal tar, crude light oil, and the crude products made from them, as well as the quantities of the several kinds of tar distilled are shown in Table 6. These statistics represent a combination of data reported to the Tariff Commission by the distillers of purchased tar, and of data reported to the Bureau of Mines by coke-oven operators who distill tar produced by themselves.

**Table 3.—Intermediates, dyes, and certain other classes of coal-tar chemicals: Comparison of United States production and sales, average 1925-30, annual 1936-39.**

[Production and sales in thousands of pounds, value in thousands of dollars.]

| Product | Average, 1925-30 | 1936 | 1937 | 1938 | 1939 | Increase, 1939 over 1938 Per cent. |
|---|---|---|---|---|---|---|
| Intermediates: | | | | | | |
| Production | 267,492 | 509,706 | 575,893 | 401,943 | 607,175 | 51.1 |
| Sales | 109,133 | 223,119 | 242,194 | 171,514 | 269,084 | 56.9 |
| Sales value | 22,408 | 31,806 | 35,639 | 26,090 | 38,489 | 47.5 |
| Finished coal-tar products:[1] | | | | | | |
| Production | 138,078 | 336,348 | 373,063 | 276,387 | 437,867 | 58.4 |
| Sales | 133,964 | 287,276 | 315,742 | 245,340 | 353,604 | 44.1 |
| Sales value | 65,027 | 120,765 | 128,736 | 104,372 | 146,156 | 40.0 |
| Dyes: | | | | | | |
| Production | 94,003 | 119,523 | 122,245 | 81,759 | 120,191 | 47.0 |
| Sales | 92,207 | 117,573 | 118,046 | 87,803 | 114,494 | 30.4 |
| Sales value | 39,428 | 63,686 | 64,613 | 53,096 | 70,224 | 32.3 |
| Medicinals: | | | | | | |
| Production | 4,508 | 12,034 | 14,800 | 11,097 | 15,188 | 36.9 |
| Sales | 4,106 | 10,079 | 11,989 | 8,885 | 12,932 | 45.5 |
| Sales value | 7,464 | 9,763 | 11,496 | 9,509 | 13,711 | 44.2 |
| Flavors and perfume materials: | | | | | | |
| Production | 3,966 | 3,481 | 4,356 | 3,837 | 5,349 | 39.4 |
| Sales | 3,919 | 3,437 | 3,907 | 3,664 | 4,938 | 34.8 |
| Sales value | 2,901 | 3,220 | 3,983 | 3,368 | 4,447 | 32.0 |
| Resins: | | | | | | |
| Production | [2] 24,442 | 117,302 | 142,025 | 106,923 | 179,338 | 67.7 |
| Sales | [2] 22,135 | 86,214 | 109,201 | 84,764 | 128,420 | 51.5 |
| Sales value | [2] 7,756 | 17,056 | 20,582 | 15,811 | 23,028 | 45.6 |

[1] Includes color lakes, rubber chemicals, and miscellaneous coal-tar products not shown separately.
[2] 1927-30 average.

**Table 5.—Synthetic organic chemicals of non-coal-tar origin: Comparison of United States production and sales, average 1925-30, annual 1936-39.**

[Production and sales in thousands of pounds, value in thousands of dollars.]

| Item | Average, 1925-30 | 1936 | 1937 | 1938 | 1939 | Increase 1939 over 1938 Per cent. |
|---|---|---|---|---|---|---|
| Production | 379,972 | 2,041,455 | 2,529,650 | 2,409,456 | 3,034,655 | 25.9 |
| Sales | 264,006 | 1,034,921 | 1,168,149 | 1,121,608 | 1,532,363 | 36.6 |
| Sales value | 44,499 | 105,832 | 119,420 | [1] 146,435 | 199,698 | 36.4 |

[1] Adjusted so as to be on the same value basis as 1939.

**Table 6.—Coal-tar crudes.[1] United States production and sales, 1939.**

[The numbers in the second column refer to the numbered alphabetical list of manufacturers printed on p. 58. An X signifies that the manufacturer did not consent to the publication of his identification number with the designated product. Blanks in the third, fourth, and fifth columns indicate that the statistics of production or sales cannot be published without revealing information with regard to individual firms.]

| Tar distilled by purchasers thereof:[2] | Gallons | |
|---|---|---|
| Oil-gas tar | 16,230,837 | $809,362 |
| Water-gas tar | 21,320,255 | 958,079 |
| Coal tar | 297,320,098 | 15,892,717 |
| Total | 334,871,190 | 17,660,158 |

| Product | Production (quantity) | Sales: Quantity | Sales: Value | Sales: Unit value |
|---|---|---|---|---|
| Tar[3] (gallons) | 554,406,216 | 344,534,382 | $16,585,734 | $0.048 |
| Light oil and derivatives: | | | | |
| Crude light oil (gallons) | 170,993,376 | 9,397,726 | 730,591 | .078 |
| Benzol (except motor benzol) (gallons) | 30,470,459 | 26,627,639 | 3,617,953 | .136 |
| Motor benzol (gallons) | 86,245,584 | 81,671,632 | 7,678,770 | .094 |
| Toluol, crude and refined (gallons) | 24,355,116 | 24,683,051 | 4,952,453 | .201 |
| Solvent naphtha, crude and refined (gallons) | 7,468,386 | 7,093,186 | 1,355,079 | .191 |
| Xylol[3] (gallons) | 4,089,090 | 4,393,400 | 1,018,589 | .232 |
| Other light oil products (gallons) | 6,684,622 | 4,562,135 | 443,469 | .097 |
| Naphthalene, crude (solidifying under 79° C.)[4] (pounds) | 104,085,593 | 87,836,963 | 1,517,240 | .017 |
| Anthracene, crude (less than 30 per cent)[2] (pounds) | | | | |
| Cumene[2] (gallons) | | | | |
| Cresylic acid, crude (less than 75 per cent.)[2] (gallons) | | | | |
| Pyridine (gallons) | 217,517 | 164,256 | 269,831 | 1.64 |
| Creosote oil (gallons) | 110,241,843 | 101,486,998 | 12,384,939 | .122 |
| Coal tar sold or consumed in coal-tar solution[2] (gallons) | | | | |
| Tars, crude and refined[2] (gallons) | 33,957,602 | 32,258,215 | 2,181,744 | .068 |
| Tars, road[2] (gallons) | 149,835,943 | 137,696,311 | 11,191,316 | .081 |
| Other distillates[5] (gallons) | 42,680,147 | 10,740,339 | 1,542,251 | .144 |
| Pitch of tar (tons) | 568,153 | 306,457 | 4,358,507 | 14.22 |
| Pitch of tar coke[2] (tons) | 90,124 | 81,443 | 1,016,351 | 12.48 |
| Total | | | 71,419,156 | |

[1] Data for coke ovens reported to Bureau of Mines, and for tar refineries and others, to United States Tariff Commission unless otherwise noted.
[2] Reported to United States Tariff Commission only.
[3] Reported to Bureau of Mines only.
[4] Includes refined naphthalene reported to Bureau of Mines.
[5] Includes crude tar acids reported to United States Tariff Commission, and phenol, sodium phenolate, and certain other products reported to Bureau of Mines.

For comparable statistics for earlier years refer to Statistical and Technical Data Section, August, 1939, pages 229-230.

## New Trade Marks of the Month

EXYLIN
434,606

CARDIOBROMINA
432,624

CREOSOYD
434,508

PRAGMOL
434,764

ALBANITE
434,978

Pomeio
435,011

San-o-la
435,030

HEED
435,062

DIGISEALS
435,792

DEVELOCHROME
435,840

VALONE
435,887

ARIGEN
435,891

SULFRAMIN
435,988

ULTRAMIN
435,989

NEMAZENE
436,033

SPIX
436,051

Longhorn
433,451

ALSILITE
435,173

CHEMIGUM
435,427

DURAMIN
435,580

CRYOVAC
422,000

CRY★O★VAC
422,001

DORSCO
428,187

RIANAL
434,701

PESCO
435,032

Compomal
434,789

OL-VITUM
434,790

FORMASET
434,953

CUROSALT
435,199

MOP-N-MIX
435,443

Flo-rite
435,546

BREVY
435,524

DERCOSOL
428,418

LUTREX
435,711

Spectrafoam
435,843

WRINTEX
435,915

FLEXALYN
435,938

RE-NEW
433,820

-GYNESTROL-
436,397

VIGOR-8
434,347

FLAYPRO
434,309

## Trade Mark Descriptions †

**434,606.** McCoy, Jones & Co., Inc., Chicago, Ill; Aug. 2, 1940; for synthetic resinous material in sheet form; since May 23, 1940.
**432,624.** Eduardo Mendes Villela; Rio de Janeiro, Brazil; June 3, 1940; for pharmaceutical preparation; since Jan. 1932.
**434,508.** H. Kirk White & Co., Oconomowoc, Wis.; July 30, 1940; for chemical preparation for preservation of wood; since Feb. 1, 1939.
**434,764.** Smith, Kline & French Labs; Phila, Pa; Aug. 7, 1940; for medicinal preparation for use in the treatment of dermatological conditions; since Aug. 1, 1940.
**434,978.** Filtrol Corp., Los Angeles, Calif; Aug. 14, 1940; for adsorptive and purifying material for treatment of dry cleaners' solvents; since May 18, 1939.
**435,011.** Anderson-Stolz Corp., Kansas City, Mo., Aug. 15, 1940; for deodorant; since Jan. 15, 1940.
**435,030.** Rochester Germicide Co., Rochester, N. Y.; Aug. 15, 1940; for disinfectant and antiseptic preparations in liquid form; since 1904.
**435,062.** The Pharma-Craft Corp., Louisville, Ky.; Aug. 16, 1940; for deodorant and non-perspirant; since Aug. 5, 1940.
**435,792.** The G. F. Harvey Co., Saratoga Springs, N. Y.; Sept. 9, 1940; for powdered digitalis leaf hermitically sealed in oil put up in capsule form; since Aug. 15, 1940.
**435,840.** Fink-Roselieve Co., Inc., New York, N. Y.; Sept. 10, 1940; for photographic preparations and photographic chemicals; since July 3, 1940.
**435,887.** U. S. Industrial Chemicals, Inc., New York, N. Y.; Sept. 11, 1940; for insecticides; since Sept. 28, 1939.
**435,891.** Aridye Corp., Fair Lawn, N. J.; Sept. 12, 1940; for textile printing pastes and textile colors; since July 26, 1940.
**435,988.**..Ultra Chemical Works, Inc., Paterson, N. J.; Sept. 14, 1940; for detergent, wetting out, and dispersing agent for textile fabrics; since Jan. 16, 1939.
**435,989.** Ultra Chemical Works, Inc., Paterson, N. J.; Sept. 14, 1940; for chemical preparation used in the softening and finishing of textile fabrics; since Apr. 18, 1839.
**436,033.** Parke, Davis & Co., Detroit, Mich.; Sept. 16, 1940; for preparation for use as an anthelmintic in animals and poultry; since Aug. 28, 1940.
**436,051.** The C. B. Dolge Co., Westport, Conn.; Sept. 17, 1940; for insecticides; since Apr. 1935.
**433,451.** South Texas Cotton Oil Co., Inc., Houston, Tex.; June 27, 1940; for linseed oil; since May 24, 1940.
**435,173.** Mineral Mining Corp., Kershaw, S. C.; Aug. 20, 1940; for serecitic ore which is a rock of sedimentary origin of micaceous texture; since July 23, 1940.
**435,427.** The Goodyear Tire & Rubber Co., Akron, Ohio; Aug. 27, 1940; for synthetic rubber; since Aug. 23, 1940.
**435,580.** The B. F. Goodrich Co., New York & Akron, Ohio; August 31, 1940; for age resisting rubber compounds; since Aug. 8, 1940.
**422,000.** Dewey and Almy Chemical Co., Cambridge, Mass.; July 27, 1939; flexible bags of rubber or rubber-like material for use with foodstuffs; since July 15, 1939.
**422,001.** Dewey and Almy Chemical Co., Cambridge, Mass., Juy 27, 1939; for receptacles, more particularly flexible bags of rubber-like material for use with foodstuffs; since July 14, 1939.
**428,187.** Dorward & Sons Co., San Francisco, Calif.; February 3, 1940; for raw and treated animal, vegetable, and marine oils for general industrial use; since March 1, 1939.
**434,701.** Lanair Chemical Corp., Chicago, Ill.; August 5, 1940; for first aid solution to be used as first aid to cleanse and sterilize wounded and abrazed surfaces; since July 30, 1940.
**435,032.** Seydel Chemical Co., Jersey City, N. J.; August 15, 1940; for chemical preparation for use in the treatment of food to retard spoilage; since March 1, 1939.
**434,789.** International Vitamin Corp., New York, N. Y.; August 8, 1940; for malt extract vitamin compound; since November 6, 1940.
**434,790.** International Vitamin Corp., New York, N. Y.; August 8, 1940; for vitamin product containing vitamins a, B-1, C, D, and G.; since Dec. 2, 1937.
**434,953.** Warwick Chemical Co., West Warwick, R. I.; August 13, 1940; for resinous materials for the finishing of all fibres, yarns, and fabrics as well as paper; since July 1, 1940.
**435,199.** Croton Chemical Corp., Brooklyn, N. Y.; August 21, 1940; for mixture of various chemicals for curing meat; since Jan. 1, 1940.
**435,443.** The J. W. Woolfolk Co., Fort Valley, Ga.; August 27, 1940; for insecticides; since August 3, 1940.
**435,546.** Garratt-Callahan Co., Chicago, Ill.; August 30, 1940; for drain cleaning chemical preparation; since November 1, 1933.
**435,524.** American Dietaids Co., Inc.; New York, N. Y.; August 30, 1940; for coffee substitute; since July 5, 1940.
**428,418.** Roland E. Derby for The Derby Co,. Lawrence, Mass.; August 27, 1940; for non-explosive solvent for textiles; since March, 1940.
**435,711.** Foster Grant Co., Inc., Leominster, Mass.; Sept. 6, 1940; for plastic material of vinyl acetate base; since Sept. 10, 1940.
**435,843.** The Goodyear Tire & Rubber Co., Akron, Ohio; September 10, 1940; for sponge and/or cellular rubber; since December 29, 1939.
**435,915.** New Wrinkle, Inc., Dayton, Ohio; Sept. 12, 1940; for resins used in the manufacture of wrinkle finishes and other paint products; since June 12, 1940.
**435,938.** Hercules Powder Co., Wilmington, Del.; Sept. 13, 1940; for synthetic resins used as a plasticizer and softening agent for starch, casein nitrocellulose, and the like; since August 22, 1940.
**433,820.** Thomas A. Fox for Re-New Products, Danville, Va.; July 10, 1940; for cleaning fluid having incidental dyeing properties; since December 1, 1939.
**436,397.** S. B. Penick & Co., New York, N. Y.; Sept. 26, 1940; for non-crystalline estrogenic hormone preparations; since Aug. 16, 1940.
**434,347.** Edwin John Staley, Toronto, Ontario, Canada; July 25, 1940; for concentrate in the form of a liquid for making a food drink; since May, 1, 1940.
**434,309.** The Borden Company, New York, N. Y.; July 25, 1940; for food supplement for use in dog food and fur bearing animal foods, consisting of lactoflavin concentrate, cod liver

† Trade marks reproduced and described include those appearing in the *U. S. Patent Gazettes,* Oct. 22 to Nov. 26, 1940.

## New Trade Marks of the Month

CALCIBRITE
431,591

DUX-BACK
WATERPROOFING WITH RUBBER
CONCRETE COTE
428,259

Cromize
435,375

SOLVAMIN
433,886

CAVPRO
434,308

HOPRO
434,310

ACLOHIDE
435,982

LITE-FLITE
436,056

DYMAL
436,066

DYPHENE
436,067

MULSOYA
436,261

ONALIM
435,305

Vano
436,204

3 Minute
STUBBLE PROOF
430,669

Swerl
436,363

LO-TURBIDITY
431,531

NATROGAS
435,142

MENESTRIN
436,398

KESTRONE
435,440

ISOTON
435,619

NICOBEE
435,753

AHCOBOND
435,863

PROVALAC
436,643

DETHDIET
436,657

SOLTUM
435,639

MIL-O-SEAL
431,871

PLASTI-GLAZE
423,439

POMO FOOD
436,463

"SPEE-DEE"
435,889

BK-5
435,886

RESIL ROCK
435,511

DOLGE
434,322

Unilube
435,480

COTACOL
436,102

DENIA
GRADO A
383,102

NUTRAN
435,652

### (*Trade Mark Descriptions Continued*)

oil, carotene, enzyme, skim milk, dehydrated cheese and vitamin B-E concentrate; since January 13, 1938.

**431,591.** Caso Inc., Providence, R. I., assigner to The Calcibrite Corp., Pawtucket, R. I.; May 6, 1940; for paints in dry, paste, and ready mixed form—namely, exterior paint, interior paint, paint enamels, and road marking paints; since July 1938.

**428,259.** L-Ewing Scott, Los Angeles, Calif.; Feb. 5, 1940; for plastic waterproofing material for concrete foundations; since Nov. 1938.

**435,375.** Standard Enamel and Paint Corp., Indianapolis Ind.; August 24, 1940; for metallic coating and finishing material; since May 10, 1934.

**433,886.** Commercial Solvents Corp., New York, N. Y.; July 12, 1940; for vitamin concentrates used as ingredients of animal foods; since April 13, 1940.

**434,308.** The Borden Co., N. Y., N. Y.; July 25, 1940; for food supplement consisting of whey, skim milk, soya bean oil meal, lactoflavin concentrate and fish liver oil concentrate, for use in feeding dairy cattle; since February 28, 1939.

**434,310.** The Borden Company, New York, N. Y.; July 25, 1940; for food supplement consisting of lactoflavin concentrate, cod liver oil, carotene, skim milk and vitamin B. concentrate, for use in feeding pigs and hogs; since October 29, 1938,

**435,982.** A. C. Lawrence Leather Co., Peabody, Mass.; Sept. 14, 1940; for leather; since August 5, 1940.

**436,056.** The Lackawanna Leather Co., Hackettstown, N. J. September 17, 1940; for leather; since August 1, 1940.

**436,066.** The Sherwin-Williams Co., Cleveland, Ohio; September 17, 1940; for synthetic resins; since August 9, 1940.

**436,067.** The Sherwin-Williams Co.; Sept. 17, 1940; for synthetic resins; since July 19, 1940.

**436,261.** The Glidden Co., Cleveland, Ohio; November 19, 1938; for soybean proteinate for use in textile sizing and the like; since November 19, 1938.

**435,305.** Louis Milano for L. M. Chemical Co., New York, N. Y.; August 23, 1940; for liquid scrub soap, having incidental disinfecting and insecticidal properties; since August 21, 1940.

**436,204.** Chemicals, Inc., San Francisco and Oakland, Calif.; Sept. 21, 1940; for household cleaner; since June 1, 1940.

**430,669.** Associated Distributors, Inc., Chicago, Ill.; April 12, 1940; for cosmetic depilatory; since February 10, 1939.

**436,363.** Raymond Soat, for Swerl Products Co., Oakland, Calif.; Sept. 25, 1940; for non-saponaceous compound for use with water as a detergent for home laundry and general household use; since March 15, 1940.

**431,531.** The Mathieson Alkali Works (Inc.), New York, N. Y.; May 3, 1940; for soda ash; since October 10, 1939.

**435,142.** Natrogas, Inc., Minneapolis, Minn; August 19, 1940; for gas for fuel for domestic and industrial use; since June 10, 1932.

**436,398.** Penick & Co., New York, N. Y.; Sept. 26, 1940; for non-crystalline estrogenic hormone substances in solution; since Oct. 1, 1940.

**435,440.** Sharp & Dohme, Inc., Phila, Pa.; Aug. 27, 1940; for substances causing cellular stimulation, including hormones and substances having the characteristics and activity of substances causing cellular stimulation including hormones, and preparations containing substances causing cellular stimulation, containing hormones and containing substances having the characteristics and activity of substances causing cellular stimulation including hormones; since August 23, 1940.

**435,619.** Isoton Co., Los Angeles, Calif.; Sept. 3, 1940; for antiseptic; since Dec. 10, 1928.

**435,753.** Endo Products. Inc., New York, N. Y.; Sept. 7, 1940; for preparation to supply nicotinic acid (anti-Pellagra factor* and vitamin B1 (anti-neuritic vitamin) Simultaneously; since Aug. 1, 1939.

**435,863.** Arnold, Hoffman & Co., Inc., Providence, R. I.; Sept. 11, 1940; for chemical products for use in processing textiles; since March 29, 1940.

**436,643.** General Biochemicals, Inc., Chagrin Falls, Ohio; October 4, 1940; for emulsion of carotene concentrate; since March 28, 1940.

**436,657.** S. B. Penick & Co., New York, N. Y.; October 4, 1940; for preparation of powdered red squill for use as a rat poison; since Sept. 26, 1940.

**435,639.** Binney & Smith Co., New York, N. Y.; Sept. 4, 1940; for carbon black for agricultural use in the fertilizer industry and as a fertilizer; since August 14, 1940.

**431,871.** Milprint, Inc., Milwaukee, Wis.; May 13, 1940; for wrapper sheets of paper, "cellophane," or "Pliofilm;" since May 1, 1940.

**423,439.** Plastic Products Company, Detroit, Mich.; Sept. 8, 1939; for glazing compound in the nature of a putty or the like; since January, 1939.

**436,463.** The Davison Chemical Corp., Baltimore, Md.; Sept. 28, 1940; for fertilizers; since March 14, 1935.

**435,889.** Oren M. Wallace, (Owosso Products Co.,) Wosso, Mich.; Sept. 11, 1940; for fabric cement for repairing clothing, grain bags, tents, awnings, waders, upholstering, canvas, and leather goods; since March 19, 1937.

**435,886.** U. S. Industrial Chemicals, Inc., New York, N. Y.; Sept. 11, 1940; for chemical light screens or filters for use in lotions and in or on films to protect surfaces from light; since Jan. 11, 1940.

**436,180.** The International Nickel Company, Inc., New York, N. Y.; Sept. 20, 1940; for coated welding rod made of a nickel alloy; since Aug. 14, 1940.

**435,511.** The C. W. Poe Company, Cleveland, Ohio; August 29, 1940; for thermal insulating material, insulating bats, insulating cement, insulating blankets, insulating stove pads, long fibre mineral wool, rock wool, granulated mineral wool; since Aug. 24, 1940.

**434,322.** The C. B. Dolge Company, West-Port, Conn.; July 25, 1940; for soaps, cleaning preparations for floors, linoleum, and varnished surfaces, windows, windshields, closet bowls, sinks, woodwork, tile, monuments, metal cleaner and polish, and a general detergent, dish washing compounds, sweeping compound, and a spray and floor wash, having incidental deodorant properties; since May, 1938.

**435,480.** Standard Oil Company of N. J., Wilmington, Del; August 28, 1940; for lubricating oils and greases; since Aug. 13, 1940.

**436,102.** John M. Tees, New York, N. Y.; for vitamin containing medicinal preparations for internal use where a vitamin deficiency is indicated; since Aug. 1, 1940.

**383,102.** Not subject to opposition Santiago Development Corp.; L. I. City, N. Y.; for powdered milk; since Sept. 7, 1938.

**435,652.** Graphic Process and Products Corp; New York, N. Y.; Sept. 4, 1940; for chemical preparations for preparing and/or retouching printing plates; since June 6, 1940.

## U. S. Chemical Patents

Off. Gaz.—Vol. 519, No. 5—Vol. 520, Nos. 1, 2, 3—p. 228

# A Complete Check—List of Products, Chemicals, Process Industries

### Agricultural Chemicals

Process for the manufacture of fertilizers from sewage sludge. No. 2,220,134. Charles S. Townsend to Wellesley Holdings, Ltd.
Production of phosphatic fertilizers. No. 2,220,575. Emil Luscher to Lonza Elektrizitatswerke und Chemische Fabriken A. G.

### Cellulose

Sheet wrapping material which comprises an organic solvent soluble cellulose derivative from the group consisting of cellulose organic acid esters and cellulose ethers plasticized with branched chain methyl butane diol. No. 2,219,296. William H. Charch to E. I. du Pont de Nemours & Company, Wilmington, Del.
Method of bleaching cellulose. No. 2,219,432. Emil Scheller to Deutsche Gold und Silber Scheide-Anhalt.
Process of nitrating cellulose. No. 2,219,644. Louis S. Baker and Ralph J. Quaid to E. I. du Pont de Nemours & Co.
Method of treating cellulose fibers. No. 2,220,426. William B. Pratt; Annette H. Pratt, administratrix to Aldox Corp.
Method of bleaching fibers of vegetable origin. No. 2,220,682. Hans O. Kauffmann and Harry G. Smolens to Buffalo Electro-Chemical Company, Inc.
Method of treating cellulose fibrous materials for the ultimate hydration thereof. No. 2,220,804. William B. Pratt, Annette H. Pratt, administratrix to Aldox Corporation.
Process converting cellulose material into soluble compounds by means of hydrochloric acid. No. 2,220,846. Edmund Neu.
A flexible, durable water-sensitive cellulosic structure. No. 2,221,383. Franklin Traviss Peters to E. I. du Pont de Nemours & Co.

### Chemical Specialty

A parasiticidal composition for making a spray. No. 2,219,287. Robert B. Arnold to Tobacco By-Products and Chemical Corporation.
Method and apparatus for producing fibrous glass material. No. 2,219,346. John H. Thomas and George M. Lanna to Owens-Corning Fiberglass Corp.
A parasiticidal composition of matter comprising cuprous oxide, magnesium oxide, and sulfite-cellulose residue, and spray containing said composition and water. No. 2,219,364. James Gordon Horsfall and Ross F. Suit. Horsfall to Cornell Research Foundation and Suit to Rohm and Haas Co.
Method mixing battery paste comprising lead oxide and sulfuric acid. No. 2,219,404. Bruce L. Simpson to Herbert S. Simpson.
Compound for treating water in boilers. No. 2,219,416. Dudley K. French to The Dole Valve Company.
Method preparing an extruding die from a mixture of a silicate and a powdered oxide of a metal of the fourth group and even series of the periodic system. No. 2,219,442. Isidor Chesler and Karl M. Herstein to Eagle Pencil Company.
A splinterless glass comprising a plurality of glass sheets and an intermediate layer comprising a product obtainable by polymerizing vinyl esters of organic acids in the presence of peroxides of fatty acids of high molecular weight. No. 2,219,433. Werner Starck and Werner Heuer to General Aniline & Film Corp.
A resilient composition comprising cork coated with a heat-cured reaction product of an alkaline polysulfide and an organic compound. No. 2,219,550. Samuel M. Martin, Jr., to Thiokol Corp.
Continuous process producing liquid filled medicinal capsules. No. 2,219,578. Paul S. Pettenger to Sharp & Dohme, Inc.
Decolorizing and filtering agent. No. 2,219,581. Richard W. Schmidt to The Decalite Co.
Adhesive for use in holding newspaper to glazed surfaces for protective purposes. No. 2,219,583. Leonard G. Vande Bogard to Crane Co.
A composition for making relief printing plates. No. 2,219,587. Clarence E. Boutwell.
A laminated article comprising two sheets of glass having there between a film of a solid polymer of ethylene which melts at temperatures above 100° C. No. 2,219,684. Eric W. Fawcett, Reginald O. Gibson and Michael W. Perrin to Imperial Chemical Industries, Ltd.
Apparatus for electroplating metals on mirrors. No. 2,219,695. Paul R. Morris and Elmer J. Ballintine to Pittsburgh Plate Glass Co.
Process of making parched corn. No. 2,219,777. Albert F. Halloway and Robert L. Goodin to Olin Manufacturing Co.
Process for deinking imprinted paper. No. 2,219,781. Richard H. Lowe, to The General Engineering Co.
Deterioration inhibitor for a hydrocarbon motor fuel. No. 2,219,859. James C. White to Eastman Kodak Co.
A translucent luminescent glass in which the components rendering the glass translucent consist of luminescent materials segregated out in the crystalline form, the glass being substantially free from alkalies. No. 2,219,895. Walter Hanlein to General Electric.
An embalming fluid. Hilton I. Jones to National Selected Morticians.
A refractory product comprising the high temperature reaction product of zirconium mineral and 1%-2% by weight of an asbestos mineral. No. 2,220,019. John D. Morgan to Power Patents Co.
Heated treatment process making a hardboard product substantially free of surface defects from vegetable fiber. No. 2,220,047. William H. Mason to Masonite Corp.
Method degumming tobacco. No. 2,220,072. John M. Baer to The Guardite Corp.
A fluid coating composition comprising petroleum naphtha containing a solution rubber, paraffin wax and resin. No. 2,220,152. Charles R. Hill.
Method of manufacturing sheet asbestos products. No. 2,220,386. Marion S. Badollets to Johns-Manville Corp.
Refractory and method of making same. Nos. 2,220,411-412. Charles J. Kinzie and Eugene Wainer to The Titanium Alloy Manufacturing Co.
A printing ink which is substantially non-drying at ordinary temperatures and dries rapidly under heat. No. 2,220,621. Carleton Ellis to Ellis Laboratories, Inc.
Treatment for animal fiber. No. 2,220,805. William B. Pratt, Annette H. Pratt, administratrix to Aldox Corporation.
Method of distillery slop filtration. No. 2,220,844. Adolph W. Lissauer to Louisville Drying Machinery Company.
Reduction of surface reflection. No. 2,220,861. Katharine B. Blodgett to General Electric Co.
Low-reflectance glass. No. 2,220,862. Katharine B. Blodgettt to General Electric Co.
Color correction process and product for photographic work. No. 2,221,025. David L. MacAdam and Cyril J. Staud to Eastman Kodak Company.
A parasiticide preparation containing as an active constituent 2,5-dimethyl pyrrole. No. 2,220,980. Wm. P. terHorst to United States Rubber Co.
A fungicide preparation containing mono-hydroxy-diphenylamine in which the hydroxyl hydrogen atom is replaced by an acidyl group. A fungicide preparation containing a mono-hdroxy-diphenylamine in which the hydroxyl hydrogen atom is replaced by a boric acid residue. No. 2,220,981. Wm. P. terHorst to United States Rubber Co.
A remoistening adhesive. No. 2,220,987. Hans F. Bauer, Jordan V. Bauer and Don M. Hawley to Stein, Hall Mfg. Co.
Adhesive of the remoistening type. No. 2,220,988. Hans F. Bauer, Jordan V. Bauer and Don M. Hawley to Stein, Hall Mfg. Co.
Molded flooring material. No. 2,221,038. Harry M. Austin to Crown Cork & Seal Co., Inc.
Pelletized Portland cement product comprising finely ground cement particles formed into a pellet, individual particles of said pellets being associated together by a destructible bond whereby they may be readily disassociated. No. 2,221,175. Ira C. Bechtold to California Portland Cement Company.
Method for paint removal. No. 2,221,318. Archie G. Worthington and Ralph S. Euler.
Method of preparing petroleum waxes for coating containers. No. 2,221,341. George D. Beal to Continental Can Company, Inc.
A fluid adhesive sound deadening composition adapted to be applied to a panel surface, comprises mixture of an emulsion of water and asphalt together with said. No. 2,221,499. Joseph A. Torri to J. W. Mortell Co.
Dry uncooked fudge powder containing, in addition to normal fudge ingredients, ground, pre-gelatinized starch in a dry state. No. 2,221,563. David J. Young, Jr., to Corn Products Refining Co.
Blueprint coating solution containing light-sensitive ferric salt, ferricyanide and complex alkali metal amino-amidine ferrocyanide. No. 2,221,-628. Robert B. Barnes, Garnett P. Ham and Leonard P. Moore to American Cyanamid Co.
An insecticidal and fungicidal oil. No. 2,221,722. Frank App.
A photographic silver halide emulsion, containing a sensitizing dye for the emulsion and thiocyanate from a group consisting of ammonium thiocyanates and metal thiocyanates. No. 2,221,805. John A. Leermakers to Eastman Kodak Co.
A stable viscous rust removing composition consisting of a mixture of phosphoric acid and at least one low alkylated cellulose ether. No. 2,221,968. Herbert Friedman.
Process for the preservation of eggs and fresh fruit. No. 2,222,000. Erich K. J. Schmidt.
Oleaginous product adapted for mixing with water for producing horticultural spray emulsion comprising hydrocarbon oil, nitrophenol, fish oil intermediate solvent for said nitrophenol and said hydrocarbon oil, and an emulsifying agent. No. 2,222,109. Frank F. Lindstaedt.
As new article of manufacture, refractory articles comprising graphite, residual carbon bond, and an oxygen compound of manganese, said article having in consequence of said oxygen compound of manganese a self-healing protective glaze. No. 2,222,184. Raymond M. Shremp to Lava Crucible Company of Pittsburgh.
As new article of manufacture, an emulsion adapted for use in making graphite and the life refractory articles containing residual carbon bond. No. 2,222,188. Harold E. White to Lava Crucible Company of Pittsburgh.
Method of and compositions for influencing the growth of plants. No. 2,222,225. Arthur G. Green.
Photographic silver halide emulsion containing a sensitizing dye for emulsion and containing silver cyanide. No. 2,222,262. John A. Leermakers to Eastman Kodak Co.
Photographic silver halide emulsion which has been subjected to a digestion step during the preparation of the emulsion. No. 2,222,264. Adolph H. Nietz and Frederick J. Russell to Eastman Kodak Co.
Method of processing cereals for rapid filtration and recovery of grain solubles. No. 2,222,306. Harry G. Atwood.
Method preventing and laying dust in coal mines by use of liquid emulsion containing petroleum oil of low volatility, water, and a sodium sulfonate. No. 2,222,370. Ernest Mori to Gulf Research & Development Co.
1. Insecticidal composition for soft bodied insects and allied pests including a dinitro dialkyl phenol or salt thereof. 2. Insecticidal composition for soft bodied insects and allied pests including a dinitro diamyl phenol or salt thereof. No. 2,222,486. William Moore to American Cyanamid Co.
A finely divided luminescent material of Willemite type ground to fine size after production thereof. No. 2,222,509. Sampson Isenberg to General Luminescent Corp.
Process producing wrapping material which comprises incorporating in sheet material permeable to ultra-violet rays a compound to effectively absorb ultra-violet rays. No. 2,222,532. John Eggert and Bruno Wendt to Walther H. Duisberg.

### Coal Tar Chemicals

Separation of benzol from coke oven and like gases. No. 2,219,782. Guido Maiuri.
Pyridine composition for treatment of blue mold in plants and seed beds. No. 2,219,847. Preston P. Purdum.
2-halogenpyrimidines bearing in the 4-position a dialkyl-amino group. No. 2,219,858. Kurt Westphal, to Winthrop Chemical Company, Inc.
A method of cyanidation which comprises carrying out the cyanidation in the presence of coloring matter included in the group consisting of

## U. S. Chemical Patents

**Off. Gaz.—Vol. 519, No. 5—Vol. 520, Nos. 1, 2, 3—p. 229**

sulfonated nigrosine, "sap brown," and sulfonated betanaphthol still tar. No. 2,220,034. Robert B. Booth to American Cyanamid Co.

An N-(alpha-isoalkylidene)-aminophenol. No. 2,220,065. Richard G. Clarkson to E. I. du Pont de Nemours & Co.

Iodized hydroxy derivatives of 2-phenylquinoline-4-carboxylic acid and a method of producing the same. No. 2,220,086. Max Dohrn and Paul Diedrich to Schering Corp.

Mixture of a plurality of sulfonic acids. No. 2,220,099. Fritz Guenther, Hans Haussmann, and Walter Frank to General Aniline & Film Corp.

2-methyl-4-amino-5-thioformylaminomethylpyrimidine and process for the manufacture of amides of thioformic acid. No. 2,220,243. Max Hoffer to Hoffmann-La Roche, Inc.

Synthetical production of liquid hydrocarbons from carbon monoxide and hydrogen. No. 2,220,357. Michael Steinschlager, to Koppers Co.

Cyclopentano-phenanthrene compounds and method of producing same. No. 2,220,623. Erwin Schwenk and Bradley Whitman to Schering Corp.

Method producing asphalt from petroleum residual oil containing less than about 10% of asphaltenes. No. 2,220,714. Arthur B. Hersberger to The Atlantic Refining Company.

Phenolic triamines. No. 2,220,834. Herman A. Bruson and Clinton W. MacMullen to The Resinous Products & Chemical Co.

Oxides of phenolic amines. No. 2,220,835. Herman A. Bruson and Rush F. McCleary to Rohm & Haas Company.

Lower molecular weight, sulpho-mono-carboxylic acid esters of alcohols containing at least eight carbon atoms, hydrogen of the sulfonic groups of the sulfomono-carboxylic acid radical being replaced by substituted ammonium radicals. No. 2,221,377. Benjamin R. Harris to The Emulsol Corp.

Catalytic hydrogenation of aromatic compounds containing an oxygen-sulfur group. No. 2,221,804. Wilbur A. Lazier, and Frank K. Signaigo to E. I. du Pont de Nemours & Company.

Purification of liquid or liquefiable materials derived from coal. No. 2,221,866. Henry Dreyfus.

Production of valuable carbonaceous substances. No. 2,221,952. Mathias Pier, Wilhelm Urban, and Ernst Donath to Standard-I. G. Company.

### Coatings

A casein coating composition containing a partly water-soluble aliphatic alcohol. No. 2,220,700. Francis C. Atwood to Atlantic Research Associates, Inc.

Salve-like composition for coating the skin essentially consisting of a cellulose organic acid ester and a miscible vegetable oil having iodine number not greater than 125. No. 2,221,139. Gordon D. Hiatt to Eastman Kodak Company.

Process coating metal surface composed preponderantly of zinc comprising electroplating said surface with a white brass and thereafter electroplating nickel onto the white brass from an acidic nickel plating solution. No. 2,221,562. Christian J. Wernlund to E. I. du Pont de Nemours & Co.

Process for producing decorative ornamental and utilitarian finishes on nickel and nickel surfaced articles. No. 2,221,641. Burton B. Knapp to The International Nickel Company, Inc.

### Dyes, Stains, etc.

Dyestuffs and process of making same. No. 2,219,280. Charles Graenacher and Richard Sallmann to Society of Chemical Industry in Basle.

A composition comprising a xanthinic base and a sulfonated anthraquinone dyestuff containing at least two substituents in the anthraquinone nucleus selected from the group consisting of hydroxyl, amino and substituted amino groups. No. 2,219,313. Robert C. Hoare, to National Aniline and Chemical Company, Inc.

Sulfonated azo dyestuff, yellow to brown black powders dissolving in water to yellow to orange, to brown, to blackish and to green solutions, and dyeing the fiber similar tints of good fastness. No. 2,219,712. Max Schmid to Society of Chemical Industry in Basle.

In process for leveling out colors between goods made from synthetic linear polyamide fibers which have been dyed in different shades with water insoluble cellulose acetate dyes, the step which comprises heating the polyamide goods of different shades in an aqueous solution of a dispersing agent at temperatures of from 180° to 200° F. until the shades and strengths of the colors are equalized. No. 2,220,129. Philip H. Stott to E. I. du Pont de Nemours & Co.

A liquid composition for the color treatment of cement floors and the like. No. 2,220,341. Ralph E. Madison and Arthur T. Saunders to Truscon Laboratories, Inc.

Metallized acid polyazo dyes. Nos. 2,220,396-397. Moses L. Crossley and Lincoln M. Shafer to American Cyanamid Company.

Printing colors suitable for printing vegetable, animal and synthetic fibers, which contain a water-soluble acyl derivative of a difficultly soluble dyestuff in which the water-solubilizing group is in the acyl radical, and which also contains a water-soluble N,N'-diacylated methylene diamine. No. 2,220,402. Charles Graenacher and Paul Streuli to Society of Chemical Industry in Basle.

Monoazo-dyestuffs insoluble in water but very easily soluble in organic solvents and yielding vivid yellow and orange tints of good properties of fastness, especially of good fastness to light. No. 2,220,598. Ernst Fischer, to General Aniline & Film Corp.

Azo dyestuffs. No. 2,220,963. Arthur H. Knight to Imperial Chemical Industries, Ltd.

Azo compounds and material colored therewith. No. 2,221.020. Joseph B. Dickey to Eastman Kodak Company.

Azo compounds and material colored therewith. Nos. 2,221,027 to 2,221,029. James G. McNally and Joseph B. Dickey to Eastman Kodak Company.

Nitro-dyestuffs and process of preparing them. No. 2,221,131. Erich Fisher and Walter Gmelin, Richard Huss, Hans Krzikalla and Heinz Pardon to General Aniline and Film Corp.

Metal compounds of azo dyestuffs which yields yellow tints on vegetable fiber. Nos. 2,221,360-361. Max Schmid to Society of Chemical Industry in Basle.

Process of dyeing with vat colors and apparatus therefor. No. 2,221,-780. John E. Conrad and William R. Keen to Collins & Aikman Corp.

Method coloring photographic material with an azo dye. No. 2,221,792. Béla Gáspár and László Schwarc. Schwarc to Gáspár.

Method of producing photographic dyestuff pictures. No. 2,221,793. Bélá Gaspar.

Azo compounds and material colored therewith. No. 2,221,911. Joseph B. Dickey to Eastman Kodak Co.

Chromable dyestuffs of the triarylmethane series and process of preparing them. No. 2,221,965. Wilhelm Eckert and Karl Schilling to General Aniline & Film Corp.

Agents for after-treating dyeings or insoluble azo dyestuffs to improve fastness to rubbing of dyeings. No. 2,222,285. Hans Ellner to General Aniline & Film Corp.

Process for manufacturing new sulfur dyes. No. 2,222,482. Walter Hagge, Kreis Bitterfeld and Karl Haagen to General Aniline & Film Corp.

Method stripping an indigo dye. No. 2,222,526. David J. Block to Hobart M. Cable.

Acyl derivatives of azo dyestuffs and process of producing same. No. 2,222,733. Franz Ackerman to Society of Chemical Industry in Basle.

Disazo dyestuffs and their manufacture. No. 2,222,749. Adolf Krebser to J. R. Geigy A. G.

Monoazo dyestuffs insoluble in water. No. 2,222,763. Ernst Fisher to General Aniline & Film Corp.

Azo dyestuffs insoluble in water. No. 2,222,775. Wilhelm Kunze to General Aniline & Film Corp.

Art of increasing fading resistance of dyestuffs. No. 2,222,973. Johan Bjorksten to Ditto, Inc.

### Equipment and Apparatus

Charging device for charging liquid coking material into coke ovens. No. 2,219,307. Herbert Gruber to Koppers Company.

Apparatus for manufacture of mineral wool. No. 2,219,384. Daniel C. Drill to American Rock Wool Corp.

Rotary tube oven for the globular transformation of coal. No. 2,219,-407. Henry F. J. Baptist.

Gas analysis method and apparatus. No. 2,219,540. Benjamin Miller to Power Patents Co.

An apparatus for continuously converting a liquid to a semi-solid state under pressure. No. 2,219,656. Bruce De Haven Miller to The Girdler Corp.

In a cyclic system employing a reaction chamber which is pipe-connected directly to a separate crystallizing chamber, for producing a crystallizable compound in coarse granular form from a solution thereof. No. 2,219,776. William N. Henderson.

Apparatus for the continuous distillation of liquids. No. 2,220,171. Edmond H. V. Noaillon to Societe Generale de Fours a Coke, Systems Lecocq, Societe Anonyme.

Apparatus for clarifying liquid. No. 2,220,574. John S. Little and John N. Selvig to Western Electric Company, Inc.

Apparatus for steeping cellulose. No. 2,220,600. Wilhelm Grotzinger to Baker Perkins Co., Inc.

In a lining for a rotary lime or Portland cement kiln, a zone formed of dense, hard castings composed essentially of crystalline alumina. No. 2,220,701. Raymond C. Benner and George J. Easter to The Carborundum Company.

A closed and hermetically sealed chemical heater. No. 2,220,777. Donald F. Othmer.

Apparatus and process for separation of materials of different specific gravities. No. 2,220,925. Marcus A. Walker to himself and Provident Trust Company.

Chemical proportioning apparatus. No. 2,221,273. Charles M. Strasburger.

Pipe still furnace and method of heating hydrocarbons. No. 2,221,469. David G. Brandt to Power Patents Company.

Apparatus for manufacturing carbon dioxide. No. 2,221,520. Johannes B. Kessel and Fritz Lessing 1/6 to Johannes B. Kessel, 1/3 to Louis Hoffberg, 1/6 to Lawrence A. Jacobson and 1/3 to Frieda Lessing.

Mineral classifying apparatus. No. 2,221,538. Willing B. Foulke to E. I. du Pont de Nemours & Co.

Apparatus for separating materials of different specific gravities. No. 2,222,030. Harold G. Hague to Provident Trust Co. of Philadelphia.

In an acetylene generator, a carbide feed mechanism. No. 2,222,171. George M. Deming to Air Reduction Co., Inc.

An arrangement for circulation of photographic baths in a film developing apparatus. Walter Geyer.

Lime burning and kiln therefor. No. 2,222,244. John F. Simpson to Orthostyle, Ltd.

Method and apparatus for catalytic reaction. No. 2,222,304. Thomas P. Simpson, John W. Payne and John A. Crowley, Jr., to Socony-Vacuum Oil Co., Inc.

Apparatus for desuperheating vapor. No. 2,222,348. Harvard H. Gorrie to Bailey Meter Company.

Crude fiber digestion apparatus. No. 2,222,463. Alexander I. Newman and Loyal C. Short to Precision Scientific Company.

Method and apparatus for treatment of hydrocarbons. No. 2,222,489. Lewis W. Riggs ½ to T. M. Chatterton.

Method continuously rendering boiler feed water applicable for use in closed system of steam generation. No. 2,222,559. Benjamin C. Boeckeler to The Lummus Co.

### Explosives

Ammonium nitrate explosive composition. No. 2,220,891. Melvin Alonzo Cook, Clyde O. Davis and Walter E. Lawson to E. I. du Pont de Nemours & Co.

Method of preparing ammonium nitrate explosives. No. 2,220.892. Melvin Alonzo Cook, Clyde O. Davis and Walter E. Lawson to E. I. du Pont de Nemours & Co.

Manufacture of double base propellent powders. No. 2,221,391. Ed. Whitworth and Thom Thompson to Imperial Chemical Industries, Ltd.

An explosive composition of improved nonsetting properties comprising ammonium nitrate coated with zinc tetramino-nitrate. No. 2,222.175. Thorvald W. Hauff and Harrison H. Holmes to E. I. du Pont de Nemours & Co.

## U. S. Chemical Patents

**Off. Gaz.—Vol. 519, No. 5—Vol. 520, Nos. 1, 2, 3—p. 230**

### Fine Chemicals

Method of packaging hydrogen peroxide which comprises treating the interior surface of an aluminum vessel with a non-oxidizing acid to etch the same and thereafter placing hydrogen peroxide in said vessel in contact with the surface so treated. No. 2,219,293. Max E. Bretschger, Hans O. Kauffmann and Frederick A. Gilbert to Buffalo Electro-Chemical Co., Inc.

The method of packaging hydrogen peroxide which comprises treating the interior surface of an aluminum vessel with sulfuric acid to etch the same and thereafter placing hydrogen peroxide in said vessel in contact with the surface so treated. No. 2,219,294. Max E. Bretschger, Hans O. Kauffmann and Frederick A. Gilbert to Buffalo Electro-Chemical Company, Inc.

Process preparing a phthalocyanine sulfonic acid chloride comprising treating a phthalocyanine above 100° C. with chlorosulfonic acid. No. 2,219,330. Friedrich Nadler, Hans Hoyer and Otto Bayer to General Aniline & Film Corp.

Composition of matter consisting of resultant product obtained by mixing insulin and reaction product of substance of class consisting of formaldehyde and its polymers with substance of class consisting of guanidine, its salts, and the guanidine derivatives decamethylenediguanidine dihydrochloride and 4,4'-diguanidodiphenyl dihydrochloride. No. 2,219,350. George B. Walden to Eli Lilly and Co.

Method of saccharifying amyloceous material. No. 2,219,368. William K. McPherson and Leo M. Christensen to The Chemical Foundation, Inc.

Process crystallizing dextrose hydrate from starch converted dextrose solutions. No. 2,219,513. Charles J. Copland to Corn Products Refining Co.

Compounds of the class consisting of 5-Al-alkenyl thiobarbituric acids in which the alkenyl group is an open chain group having at least three carbon atoms, and their salts. No. 2,219,543. Arthur C. Cope to Sharp & Dohme, Inc.

Compounds of the class consisting of primary 5-Al-alkenyl thiobarbituric acids, in which the Al-alkenyl group has at least three carbon atoms, and their salts. No. 2,219,549. Walter H. Hartung and Frank S. Crossley to Sharp & Dohme, Inc.

Method activating a silver catalyst and process for making olefin oxides. No. 2,219,575. Raymond W. McNamee and Henry C. Chitwood and George H. Law to Carbide and Carbon Chemicals Corp.

Nitrogenous condensation product of fluoranthene and process of making same. No. 2,219,707. Walter Kern, Theodor Holbro and Richard Tobler to Society of Chemical Industry in Basle.

Manufacture of water-soluble double salts of purine derivatives. No. 2,219,741. Ferdinand Hoffman to Byk-Guldenwerke Chemische Fabrik Aktiengesellschaft.

Thioxane sulfur trioxide addition compound. No. 2,219,748. Paul Nawiasky and Gerhard E. Sprenger to General Aniline & Film Corp.

Process for obtaining proteohormones with albumin character. No. 2,219,791. Erich Rabald and Fritz Johannessohn to Rare Chemicals, Inc.

Esters of amino alcohols and process for producing them. No. 2,219,796. Pierre Viaud to Societe Des Usines Chemiques.

Method of production of diethylene diamine. No. 2,219,839. Stanislaw Grosberg to Scott & Bowne Spotka Akeyjna, Towarzystwo Przemystowo-Handlowe dla Wyrobow Chemiczano Farmaceutycznych.

Process for the manufacture of araliphatic chloromethyl compounds. No. 2,219,873. Walter Pinkernelle to I. G. Farbenindustrie Aktiengesellschaft.

Cyclic process for production of dialkylamines. No. 2,219,879. Byron M. Vanderbilt to Commercial Solvents Corp.

An ester of a homo cyclic alcohol and vanadic acid. No. 2,220,041. William H. Hill to American Cyanamid Co.

An amidine vanadate. No. 2,220,042. William H. Hill to American Cyanamid Company.

Process for manufacture of alkyloamines. No. 2,220,147. Henry Dreyfus.

Method of producing terpene ether which includes reacting unsaturated terpene compound with polyhydric alcohol in presence of acidic catalyst at temperature within the range of 30-60° C. No. 2,220,462. Donald H. Sheffield to Hercules Powder Company.

Improving the wash-fastness of sizes with amino-methylamide derivatives. No. 2,220,508. Louis H. Bock and Alva L. Houk to Rohm and Haas Company.

Thiocyano esters. No. 2,220,521. William F. Hester to Rohm & Haas Co.

Bismuth salts of a substituted malonic acid and process of making them. No. 2,220,638. Friedrich Boedecker and Heinrich Gruber.

Process making stable, free-flowing non-hygroscopic white crystalline salts of mandelic acid. No. 2,220,692. Donalee L. Tabern, Edmond E. Moore, Hugh D. Robinson, Robert S. Frye and James E. Rundell to Abbott Laboratories.

A process for producing alkyl fluorides from olefins of higher molecular weight than ethylene which comprises reacting the olefin with hydrogen fluoride at a temperature below 0° C. No. 2,220,713. Aristid V. Grosse and Charles L. Thomas to Universal Oil Products Company.

A salt of substantially pure ergotocin and an acid of the class consisting of maleic acid and succinic acid. No. 2,220,801. Morris S. Kharasch and Romeo R. Legault to Eli Lilly and Company.

A maleic acid ester. No. 2,220,854. Harold R. Slagh to The Dow Chemical Co.

Unsaturated esters of fumaric acid. No. 2,220,855. Harold R. Slagh to The Dow Chemical Co.

Manufacture of anhydrides of higher fatty acids. No. 2,221,026. Carl J. Malm and Webster E. Fisher to Eastman Kodak Company.

Preparation of animated esters of sulphydryl compounds. No. 2,221,147. Roger A. Mathes to The B. F. Goodrich Company.

Alkyl and cycloakyl derivatives of 1,3-dimethyl-1,3-diphenyl-cyclobutane. No. 2,221,271. Frank B. Smith and Harold W. Moll to The Dow Chemical Company.

An ester of 2-chloroallyl alcohol and a halogenated carboxylic acid of the aliphatic series. No. 2,221,275. Fred Lowell Taylor to The Dow Chemical Co.

Process for the separation of dihydro-equilin and estradiol. No. 2,221,340. Arthur Serini and Willy Logemann to Schering Corp.

Process for producing lactams. No. 2,221,369. Oliver W. Cass to E. I. du Pont de Nemours & Co.

Production of guanidine salts. No. 2,221,478. William H. Hill, Robert C. Swain, and Joseph H. Paden to American Cyanamid Co.

Stabilization of a zein solution by clarification. No. 2,221,560. Lloyd C. Swallen to Corn Products Refining Co.

Stabilization of a zein solution by clarification. No. 2,221,561. Lloyd C. Swallen to Corn Products Refining Co.

Polymeric esters of unsaturated polycarboxylic acids with ethynyl carbonyls having at least one hydrogen atom attached to the alkynyl carbon atom. No. 2,221,662. Henry S. Rothrock to E. I. du Pont de Nemours & Co.

Polymeric dimethallyl maleate. No. 2,221,663. Henry S. Rothrock to E. I. du Pont de Nemours & Co.

Therapeutic preparation comprising high vacuum distillate of an oil having an iodine number above about 170 in association with a fat soluble vitamin concentrate. No. 2,221,690. Kenneth C. D. Kickman to Distillation Products, Inc.

Ethers of chlorophenols. No. 2,221,771. Francis N. Alquist and Harold R. Slagh to The Dow Chemical Company.

Preparation of sodium thiocarbonate. No. 2,221,796. Sheldon B. Heath and Wallis R. Bennett to The Dow Chemical Company.

Tertiary alkyl-halo-phenols. No. 2,221,807. Lindley E. Mills to The Dow Chemical Co.

Halo-substituted polyalkyl phenols. No. 2,221,808. Lindley E. Mills and Cecil M. Galloway to The Dow Chemical Company.

Cyclohexyl-halo-phenols. No. 2,221,809. Lindley E. Mills to The Dow Chemical Co.

Hydrated crystalline 3-amino-4-hydroxy phenylarsine oxide. No. 2,221,817. Albert B. Scott, Ralph D. Hummel, Benjamin F. Tullar and Joseph Wainwright to Parke, Davis & Company.

Ethers of alkyl-phenols. No. 2,221,818. Harold R. Slagh and Francis N. Alquist to The Dow Chemical Company.

In method for preparation of alkyl phenothioxine compounds step of mixing member of group consisting of phenothioxine and mono-halo phenothioxines with olefin and heating mixture in presence of acid activated bleaching earth. No. 2,221,819. Frank B. Smith and Harold W. Moll to The Dow Chemical Co.

Cycloalkyl-phenothioxine compounds. No. 2,221,820. Frank B. Smith and Harold W. Moll to The Dow Chemical Company.

Separation of pregnenolone esters. No. 2,221,826. Bradley Whitman and Erwin Schwenk to Schering Corp.

Esters of amino alcohols having a tertiary amino group, with 9-hydroxy-fluorene-9-carboxylic acid. No. 2,221,828. Otto Wolfes and Otto Hromatka to Merck & Company, Inc.

Antimonyl-catechol-salicylic acid-sodium salt, a white solid soluble in water, having therapeutic value. No. 2,221,831. Harold P. Brown and James A. Austin to Jensen-Salsbery Laboratories, Inc.

In process of hydrolyzing benzyl halide, steps of heating said halide in presence of aqueous solution of weak alkaline substance and subsequently adding a stronger alkaline material thereto with continued heating. No. 2,221,882. Louis T. Rosenberg to National Oil Products Company.

N-acylurethanes and their manufacture. No. 2,221,914. Kurt Engel and Kurt Pfaehler to J. R. Geigy A. G.

Process for the manufacture of aminoaryl sulfones. No. 2,221,915. Friedrich Felix, Rudolf von Capeller and Richard Sallmann Society of Chemical Industry in Basle.

A pest combating agent comprising at least one aliphatic aminoketone. No. 2,221,931. Jules Treboux to J. R. Geigy A. G.

Method for making higher alcohols. No. 2,221,955. Helmuth G. Schneider to Standard Alcohol Company.

Zirconium salts of water-insoluble fatty acids and methods of making same. No. 2,221,975. Charles J. Kinzie and Eugene Wainer to The Titanium Alloy Manufacturing Company.

Preparation of 2-keto aldonic acids from aldonic acids by anodic oxidation. No. 2,222,155. Richard Pasternack and Peter P. Regna to Charles Pfizer and Company.

Synthesis of adipic acid dinitriles. No. 2,222,302. Will Schmidt and Friedrich Manchen to General Aniline & Film Corp.

Process for preparing beta-indolyl acetic acids. No. 2,222,344. Karl Bauer and Hans Andersag to Winthrop Chemical Company.

A method of preparing $\Delta^3$ tetrahydro aryl alkyl ketones which comprises reacting a butadiene with an alkyl vinyl ketone. No. 2,222,357. William D. Wolfe to Wingfoot Corp.

Tetrahydrofurfuryl alpha acetoxy propionate. No. 2,222,363. Houston V. Claborn to People of United States.

Crystalline hydrated 2-amino-4-hydroxyl phenylarsinoxide sulfate. No. 2,222,383. Benjamin F. Tullar to Parke, Davis & Co.

Therapeutic composition comprising 3-amino-4-hydroxy phenyldihalo arsine hydrohalic compound and a quantity of solid non-toxic inorganic basic compound. No. 2,222,384. Albert B. Scott, Oswold M. Gruhzit and James A. Sultzaberger to Parke, Davis & Co.

Process of producing primary $\Delta$1-alkenyl malonic esters. No. 2,222,455. Arthur C. Cope to Sharp & Dohme, Inc.

Stable organic calcium salt solutions adapted for injection. No. 2,222,520. Ernst Sturm and Richard Fleischmann to Johann A. Wulfing, Chemische Fabrik.

### Industrial Chemicals

Method forming modules of siliceous fibrous material containing an alkali metal oxide ingredient. No. 2,219,285. Frank E. Allen and Harry V. Smith to Owens-Corning Fiberglas Corp.

Method of controlling the properties of drilling fluid containing colloidal and non-colloidal matter which comprises, reducing the viscosity of said fluid by selectively removing colloidal matter therefrom by electrophoresis, thereafter separating and removing noncolloidal matter from said fluid and admixing with the resulting fluid previously removed colloidal matter to thereby increase the viscosity of said fluid. No. 2,219,312. John T. Hayward and Earl E. Huebotter to National Lead Co.

A refractory, vitreous gas impervious material consisting of Silica ($SiO_2$) 94%, Thoria ($ThO_2$) 4%, Beryllia (BeO) 2%. No. 2,219,331. Marcello Pirani and John H. Partridge to General Electric Co.

Refractory glass. No. 2,219,332. Marcello Pirani to General Electric Company.

Improvement in the preparation of phthalic anhydride by partial oxidation of naphthalene in vapor phase. No. 2,219,333. Donald A. Rogers to The Solvay Process Company.

Condensation products from paratoluene sulfonamide casein, and caustic potash. No. 2,219,369. Karl Memmingerto Fahlberg-List Aktiengesellschaft Chemische Fabriken.

A process of producing non-benzenold polymers of acetylene which comprises polymerizing acetylene in the presence of a cuprous salt and

## U. S. Chemical Patents

Off. Gaz.—Vol. 519, No. 5—Vol. 520, Nos. 1, 2, 3—p. 231

an inorganic salt of tin capable of supplying stannous ions in acid aqueous solution. No. 2,219,379. Albert S. Carter to E. I. du Pont de Nemours & Co.

Fermentation process for the production of butyl alcohol and other solvents. No. 2,219,426. James F. Loughlin.

Sodium orthosilicate and method of making same. No. 2,219,646. Brazier K. Beecher to Michigan Alkali Company.

In a process for refining fatty acids, the step of dissolving the fatty acids in liquid propane. No. 2,219,652. Arthur W. Hixson and Ralph Miller to The Chemical Foundation, Inc.

Production of calcium hypochlorite products. No. 2,219,660. Homer L. Robson and Gregory A. Petroe to The Mathieson Alkali Works, Inc.

Method producing ethyl alcohol from grain. No. 2,219,668. Lee A. Underkofler and William K. McPherson to The Chemical Foundation, Inc.

Method of producing a wax crystal modifying material. No. 2,219,691. Bernard Y. McCarty to The Texas Co.

A self-supporting inherently moisture proof film comprising essentially a solid polymer of ethylene which corresponds in composition substantially to $(CH_2)x$ and which by X-ray diffraction analysis shows a crystalline structure. No. 2,219,700. Michael W. Perrin, John G. Paton and Edmond G. Williams to Imperial Chemical Industries, Ltd.

Process making granular magnesium preparation having activated properties as an adsorbent. No. 2,219,725. Max Y. Seaton to Westvaco Chlorine Products Corp.

Activated magnesia and method of making 2,219,726. Max Y. Seaton to Westvaco Chlorine Products Corp.

Method polymerizing drying and semi-drying oils comprises heating said oils at polymerizing temperatures in presence of small amounts of beta-naphthal mercaptan. No. 2,219,862. Theodore F. Bradley and William B. Johnston to American Cyanamid Co.

Process of refining vegetable oils. No. 2,219,968. Benjamin H. Thurman to Refining, Inc.

Method and apparatus for recovering phthalic anhydride. No. 2,219,996. John W. Livingston to Monsanto Chemical Co.

Method of obtaining naphthenic acids. Nos. 2,220,012-013. Johannes H. Bruun to Sun Oil Co.

Separation of maleic and phthalic anhydrides. No. 2,220,044. Alphons O. Jaeger to American Cyanamid & Chemical Corp.

Process for reducing corrosion by ammoniacal solutions of inorganic salts and new composition of reduced corrosiveness. No. 2,220,059. Herman A. Beekhuis, Jr., and Charles K. Lawrence, to The Solvay Process Company.

Mixed triaryl phosphites. No. 2,220,113. Clarence L. Moyle, to The Dow Chemical Co.

Method for isolating cholesterol. No. 2,220,114. Samuel Natelson, Albert E. Sobel and Isaac J. Drekter.

Process of vapor-phase degreasing. Nos. 2,220,124-125. Max Y. Seaton to Westvaco Chlorine Products Co.

In polymerization of cyclopentadiene wherein boron trifluoride is employed as catalyst, steps of passing said boron trifluoride into solution of said cyclopentadiene while admixed with a second gas, and stopping the reaction while soluble polymer is present in the reaction mass. No. 2,220,211. Newcomb K. Chaney to The United Gas Improvement Company.

Process for conversion of carbon monoxide with hydrogen to produce hydrocarbons containing more than one carbon atom in molecule which comprises operating in presence, as catalyst, of sintered iron which is surrounded by hydrocarbon oil. No. 2,220,261. Wilhelm Michael and Wolfgang Jaeckh to William E. Currie.

Production of hydrochloric acid. No. 2,220,304. Osgood V. Tracy to Standard Oil Development Co.

Method producing olefines by catalytic dehydration of alcohols. No. 2,220,430. Herbert M. Stanley to The Distillers Company, Ltd.

Method for refining oxy-acids obtained from oxidized hydrocarbons. Nos. 2,220-506-507. Arthur L. Blount to Union Oil Co.

Process for absorption of hydrochloric acid from a moist gas. No. 2,220,570. David M. Hurt to E. I. du Pont de Nemours & Co.

Process for separating hydrocarbon mixtures. No. 2,220,619. Chester E. Andrews and Merrel R. Fenske to Rohm and Haas Company.

Method purifying solution of incompletely refined sugar which consists in adding to said solution a small quantity of colloidal gel comprising composite gel having approximately the following composition: 70 to 90% calcium phosphate, 2-10% calcium silicate and 2-12% aluminum hydroxide. No. 2,220,667. Pierce M. Travis to Jacques Wolf & Company.

Sulfonation products and process of manufacture No. 2,220,678. Jack H. Cromwell and Sylvia R. Merley to Power Patents Company.

Method producing high solids content, revertible water-in-oil type emulsions of a drying oil-modified alkyd resin. No. 2,220,685. Robert J. Myers and Harold C. Cheetham to The Resinous Products & Chemical Company.

Process for the production of alkali metal phosphates. No. 2,220,790. Campbell R. McCullough to Monsanto Chemical Company.

Process for the removal and recovery of fluorides from trialkali phosphates. No. 2,220,818. Frederick C. Jelsen to Monsanto Chemical Co.

Aromatic phosphites. No. 2,220,845. Clarence L. Moyle to The Dow Chemical Co.

Method converting methane and carbon dioxide into hydrogen and carbon monoxide. No. 2,220,849. Earl W. Riblett to The M. W. Kellog Company.

Method tempering a porous organic product. No. 2,220,880. John M. Baer to The Guardite Corp.

A drying oil comprising a semicarbazone of oiticica oil. No. 2,220,906. Otto Jordan and Ernst Rossmann to General Aniline & Film Corp.

Method polymerizing a hydrocarbon of the olefin series. No. 2,220,930. Charles A. Kraus to Standard Oil Development Corp.

Continuous process for separating high molecular weight oleaginous mixture into fractions having different properties. No. 2,221,093. Eric Stanley Hillmann and Wells Alan Webb to Shell Development Company.

Process of inhibiting separation of precipitants from slightly alkaline treated water containing aluminum compounds which comprises adding small amount of hemlock tannin thereto. No. 2,220,950. Paul G. Bird.

Process for the recovery of the sulphurous acid produced in the sulphite cellulose cooking process. No. 2,221,066. Friedrich-Wilhelm Kahle to Zellstoffabrik Waldhof.

Process bleaching montan wax, comprises treating wax with hydrogen Peroxide and then with cromic acid in presence of another acid easily soluble in water. No. 2,221,140. Michael Jahrstorfer and Michael Ashenbrenner to General Aniline & Film Corp.

An article of manufacture comprising mixture of following ingredients in following preparations by weight, crude oil 64, vegetable matter 20, sulfur chloride 10, powdered talc 4, magnesium oxide 4, caustic soda 2½, water 1½, carbon black 3, and benzol 1¼. No. 2,221,304. Henry Wilson to The Process Rubber Corp.

Utilization of metallo-organic compounds for treatment of circulating waters and surfaces coming into contact with water. No. 2,221,339. Wm. M. Allison to Oakite Products, Inc.

Process for manufacture of alkali phosphates. No. 2,221,356. Anton Michels to Chemische Fabrik Budenheim Aktiengesellschaft.

Substantially stabilized glyceride oil having novel flavor and odor characteristics. No. 2,221,404. Sidney Musher to Musher Foundation, Inc.

Recovery or production of unitary cyclic compounds. No. 2,221,410. Matthias Pier to I. G. Farbenindustrie Aktiengesellschaft.

Chlorinated starch and process for production of same. No. 2,221,552. John Nicolson to Corn Products Refining Company.

Process for bleaching oils, fats and waxes. No. 2,221,559. Emil Scheller to Deutsche Gold und Silber Scheideanstalt.

Process for production valuable liquid hydrocarbon products from methane gases. No. 2,221,658. Hein I. Waterman, William J. Hessels and Dirk W. van Krevelven to Shell Development Co.

As new compounds, the diethylene glycol ethyl ether esters of the fatty acids having a carbon content greater than five. No. 2,221,674. Carleton Ellis to Ellis-Foster Company.

Process for the purifying of liquids with the aid of active carbonaceous colloids. No. 2,221,683. Pieter Smit to N. V. Octrooien Maatschappij "Activit."

Process transferring a natural antioxidents substance contained in a natural glyceride oil to a valuable material which is contained in a distillable mixture which is easily oxidized. No. 2,221,692. Kenneth C. D. Hickman and James G. Baxter to Distillation Products, Inc.

A glass containing silica, boric oxide and alkali, the silica being over 94%, the boric oxide being under 6% and the alkali being under .25%. No. 2,221,709. Harrison P. Hood and Martin E. Nordberg to Corning Glass Works.

Process for oxidation of crude phosphorus. No. 2,221,770. Laurence H. Almond.

Method hydrolyzing fats and oils. No. 2,221,799. Martin H. Ittner to Colgate-Palmolive-Peet Company.

An aqueous acid solution having wetting and impregnating properties. No. 2,221,933. Michael A. Eitelman and Lawrence H. Flett to National Aniline & Chemical Co., Inc.

Process reacting vinyl acetylene with hydrogen chloride. No. 2,221,941. Albert S. Carter and Frederick B. Downing to E. I. du Pont de Nemours & Company.

In handling hot aqueous solutions of phosphoric acid method of holding said solution in container composed of alloy of silver and silicon said container being resistant to corrosion and having high creep strength at temperatures used. No. 2,221,949. Augustus B. Kinzel to Electro Metallurgical Company.

Process for dewaxing oils comprising chilling and filtering said oil. No. 2,221,993. Harold F. Oswald to Oliver United Filters, Inc.

Process for preparation of alkylated aromatic compounds. No. 2,222,-012. James L. Amos, Jack L. Williams and Henry S. Winnicki to The Dow Chemical Co.

Method of treating hydrocarbon gas comprising ethane, ethylene and normally gaseos olefinic and paraffinic hydrocarbons higher boiling than ethane to produce normally liquid hydrocarbons therefrom. No. 2,222,-055. John T. Ward to Process Management Co., Inc.

Solvent extraction of oxygenated products. No. 2,222,215. Frederick J. Ewing to Union Oil Co. of California.

Process for the separation of hydrocarbons. No. 2,222,275. Dale F. Babcock to E. I. du Pont de Nemours & Co.

Manufacture of maleic anhydride. No. 2,222,283. Joyce H. Crowell to National Aniline and Chemical Co.

Process for purification of an ore containing mixed chlorides of sodium and potassium having insoluble gangue matter as an impurity thereof. No. 2,222,230. Arthur J. Weinig to Potash Co. of America.

Process for recovery of a purified potassium chloride product from sylvinite ores. No. 2,222,331. Arthur J. Weinig to Potash Company of America.

Process treating sylvinite ores, which comprises introducing sylvinite ore in a finely divided condition into a saturated solution of the ore containing lead dissolved therein to form a pulp, and froth flotating sodium chloride and gangue constituents of the pulp by action of naphthenic acid or a salt thereof. No. 2,222,3332. Arthur J. Weinig to Potash Company of America.

Process for producing N-substitution products of melamine. No. 2,222,-350. Karl Keller and Ernst Korten to I. G. Farbenindustrie Aktiengesellschaft.

Process of making calcium sulfate which under X-ray and microscopic examination shows the crystalline structure of anhydrite. No. 2,222,385. Willis F. Washburn and Franklin L. Kinsbury to National Lead Company.

Process for producing monovinyl acetylene. No. 2,222,394. Herbert Berg, Hans Heim and Franz Leiss to Alexander Wacker Gesellschaft fur Electrochemische Industrie G. m. b. H.

A distillation process. No. 2,222,583. Wheaton W. Kraft to The Lummus Co.

### Leather

The method of treating leather, which comprises impregnating the leather with a polymer obtained by polymerization of a mixture of both normal and iso-butene. No. 2,219,867. Norman N. Gay to Standard Oil Co.

In process for tanning of skins, step comprising subjecting skin to action of acidic polymeric material in which acidity is due to carboxyl groups attached to aliphatic carbon atoms, said step being effected in presence of a foam depressant. No. 2,220,867. Joseph S. Kirk to E. I. du Pont de Nemours & Company.

### Metals, Alloys

Apparatus for the treatment and reduction of ores and metalliferous materials. No. 2,219,427. Albert W. Morris to Robert C. Travers.

A nickel-base alloy. No. 2,219,445. Russell Franks to Haynes Stellite Company.

## U. S. Chemical Patents

Off. Gaz.—Vol. 519, No. 5—Vol. 520, Nos. 1, 2, 3—p. 232

Method coloring surface of stainless steel. No. 2,219,554. Clements Batchteller to Allegheny Ludlum Corp.

Method extracting lead from ore containing PbS and ZnS. No. 2,219,-633. John Pande.

Process for producing zinc comprises charging a finely-divided, freely-falling charge of oxidic zinciferous material and alpha carbon substantially free from adsorbed gases to a flash reduction retort, and collecting the resulting zinc vapors. No. 2,219,914. Jesse O. Betterton and Melville F. Perkins to American Smelting and Refining Co.

Process for producing coatings on zinc and galvanized articles. No. 2,219,977. Otto Brill to Mannesmann-Stahlblechbau.

In cyanidation process for extraction of gold, silver or like from ores and/or concentrates, step of artificially cooling at least one of reactants to such a temperature so as its mixture with remaining reactants maintains the temperature of all reactants and products at temperature ranging from 32° to 50° F. during extraction period. No. 2,220,212. Allan J. Clark, Nathaniel Herz and Earl W. Adams.

Metallurgical flux and method of producing it. Nos. 2,220,383-385. Frederic C. Abbott and Carl O. Anderson to Mahoning Mining Company.

In process for cleaning and pickling metals and removing rust, step comprising subjecting object to be cleaned to action of water soluble compound having sulfamic acid radical $NH_2SO_3$—and being acid to litmus in aqueous solution. No. 2,220,451. James K. Hunt to E. I. du Pont de Nemours and Company.

A copper-base alloy comprising about 0.1% to 1% tin, about 0.05% to 0.5% silicon, about 0.05% to 0.5% manganese, and the balance substantially all copper. No. 2,220,464. Cyril S. Smith and Ira T. Hook to The American Brass Company.

A soldering alloy. No. 2,220,961. Emerson W. Kern to Bell Telephone Laboratories, Inc.

Method recovering silver component from waste photographic solution. No. 2,221,018. Gustave B. Bachman and Stephen C. Pool to Eastman Kodak Company.

Method recovering silver values from spent photographic solutions. No. 2,221,163. Robert Bowling Barnes and Garnett Philip Ham to American Cyanamid Company.

Process of making iron and nickel alloys. No. 2,221,061. Kenneth M. Simpson.

Magnesium base alloy. Nos. 2,221,243 to 2,221,259. John C. McDonald to The Dow Chemical Company.

A calcium base alloy containing from about 18 to 23 per cent magnesium, the balance being calcium. No. 2,221,263. Charles E. Nelson and Lawrence B. Otis to The Dow Chemical Company.

An alloy containing .002 to 3% lithium, .05 to 15% magnesium and the balance substantially all silver. No. 2,221,285. Franz R. Hensel, Kenneth L. Emmert and James W. Wiggs to P. R. Mallory and Co., Inc.

A magnesium base alloy. No. 2,221,319. Hubert Altwicker and Wilhelm Rosenkranz to Magnesium Development Corp.

Soap comprising water soluble salt of higher fatty acid stabilized against deterioration and development of rancidity by having incorporated therein more than 0.01% of mono aryl substituted biguanide. No. 2,221,-333. Robert L. Sibley to Monsanto Chemical Company.

Flotation process for concentrating ores taken from group consisting of metal carbonate and oxide ores containing siliceous gangue. No. 2,221,-485. James E. Kirby and Joseph L. Gillson to E. I. du Pont de Nemours & Co.

Process for heat treating aluminum alloys. No. 2,221,526. James M. Sampson to General Electric Co.

An ore concentrating machine. No. 2,221,589. George Kunkle.

A process of smelting copper in a reverberatory furnace. No. 2,221,-620. Richard A. Wagstaff to American Smelting and Refining Co.

Alloys of manganese and purification and treatment of manganese and manganese alloys. Nos. 2,221,622-627. Clarence T. Anderson to Chicago Development Co.

Composition of matter for use as addition agents in the treatment of iron and steel. Nos. 2,221,781-784. James H. Critchett and Walter Crafts and Electro Metallurgical Company.

Method preventing corrosion of a metal subjected to electrolytic action of a fluid. No. 2,221,997. Herbert S. Polin of ½ to Harry A. Furman.

That method of minimizing oxidation of an alloying element in producing an alloy thereof with a metal which comprises melting said metal and adding thereto coked aggregates of an intimate mixture of coking coal and said alloying element, oxidation of said alloying element during alloying thereof with said metal being prevented primarily by the coke of said aggregates. No. 2,222,035. Robert R. Jones to Ohio Ferro-Alloys Corp.

Zinc alloy consisting of .005-.10% Ni, .05-.75% Al, .002-.10% Mg, and the balance Zn containing as a total less than 0.1% of Fe, Pb, and Cd. No. 2,222,157. John Ruzicka to Atlanta Zinc Works, Inc.

Method obtaining ductile matte adherent cadmium plate upon a metal base by electroplating from acid cadmium solution in presence of addition agent from group consisting of naphthol sulfonic acids. No. 2,222,398. Henry Brown to The Udylite Corp.

Nickel base alloy. Nos. 2,222,471-474. Claude R. Bishop to Haynes Stellite Co.

Formed piece of silver palladium alloys. No. 2,222,544. Jakob Spanner, Neu-Isenburg and Josef Leuser to Chemical Marketing Company, Inc.

### Paper Pulp

Process for the hydrogenation of lignin and waste pulp liquors and the products thereof. No. 2,220,624. Earl C. Sherrard, Elwin E. Harris and Jerome F. Saeman to Henry A. Wallace, Secretary of Agriculture, U. S. and his successors.

In treatment of paper stock with aqueous alkaline solution, step of effecting such treatment in presence of nickelous compound and thereby effecting loosening of coloring agents carried by said stock. No. 2,221,294. Alfred O. Bragg to Diamond Alkali Company.

Production of mat light-sensitive photographic paper. No. 2,221,873. Julius Knoefel to General Aniline & Film Corp.

Aluminum phosphate pigmented paper. No. 2,222,198. Louis C. Fleck to Paper Patents Company.

Pigmented paper and process of making same. No. 2,222,199. Louis C. Fleck to Paper Patents Co.

### Petroleum

Process of pyrolytic conversion of hydrocarbon oils. No. 2,219,521. Jacob B. Heid to Universal Oil Products Co.

Process scrubbing cracked hydrocarbon gas with debutanized gasoline. No. 2,219,529. Robert Pyzel to Universal Oil Products Co.

Process for distillation and conversion of hydrocarbon oils. No. 2,219,-536. Kenneth Swartwood and Alvin Engelstein to Universal Oil Products Co.

Process for refining lubricating oil stocks. No. 2,220,016. Henry N. Lyons to Power Patents Co.

Process converting higher boiling hydrocarbons into lower boiling hydrocarbons. No. 2,220,020. Charles W. Nofsinger to Gasoline Products Company, Inc.

Conversion of hydrocarbon products. Nos. 2,220,090-092. Bernard L. Evering and George G. Lamb to Standard Oil Company, a corp. of Indiana.

Process for preparation of hydrocarbon polymerization product effective as sludge dispersing agent. No. 2,220,287. Raphael Rosen to Standard Oil Development Company.

Lubricating oils and method of producing same. No. 2,220,307. James M. Whiteley, Jr. and Jeffrey H. Bartlett to Standard Oil Development Co.

Lubricating oil and lubrication therewith. No. 2,220,487. Arthur W. Lewis to Tide Water Associated Oil Company.

Solvent extract of aromatic and unsaturated character from an uncracked petroleum oil distillate heavier than kerosene. No. 2,220,531. Arthur Lazar to Tide Water Associated Oil Company.

A drilling fluid comprising a mineral oil, a weighting material, and voluminous magnesium carbonate as a sedimentation inhibitor. No. 2,220,681. Philippus H. Huisman to Shell Development Co.

Process for conversion of hydrocarbon oils. No. 2,220,691. Kenneth Swartwood to Universal Oil Products Company.

Process for isomerization of olefins. No. 2,220,693. Adrianus J. van Peski and Hermanus F. J. Lorang to Universal Oil Products Co.

Cracking process for hydrocarbon oils to produce substantial yield of gasoline and heavier fractions. No. 2,220,696. Kenneth M. Watson to Universal Oil Products Company.

Process for treating hydrocarbon distillates. No. 2,220,697. Charles Wirth to Universal Oil Products Company.

Conversion process for production of high anti-knock gasoline. No. 2,220,699. Charles H. Angell to Universal Oil Products Company.

Method of cracking hydrocarbons. No. 2,220,795. Howard V. Smith to Skelly Oil Company.

An extreme pressure lubricating composition. No. 2,220,843. James W. Johnson to The Atlantic Refining Company.

A lubricant containing about .05-10% of an organic compound. No. 2,220,970. Clarence M. Loane and Bernard H. Shoemaker to Standard Oil Co., a corp. of Indiana.

Process of polymerizing olefin hydrocarbons. No. 2,221,000. Ward E. Kuentzel and William L. Webb to Standard Oil Co., a corp. of Indiana.

Method preparing lubricating oil suitable as cylinder stock, substantially free from asphaltic and acidic constituents, having desirable green cast, from reduced naphthene base crude. No. 2,221,161. Charles T. Anne, Herman I. Wilson and Wm. C. Patterson to the Texas Company.

Lubricating oil comprising a mineral oil containing .01-2.0% of a phosphatide and less than 1% of an emulsion preventing agent. No. 2,221,162. Harry V. Ashburn and Wm. G. Alsop to The Texas Company.

An apparatus for treating crude oil with a chemical. No. 2,221,169. Claude L. Raney and Howard C. Humphrey to The Texas Company.

Process for conversion normally gaseous hydrocarbons to normally liquid hydrocarbons. No. 2,221,171. Le Roy G. Story to The Texas Company.

Process for conversion of heavy hydrocarbon oils into gasoline. No. 2,221,172. Claude W. Watson and du Bois Eastman to The Texas Company.

Method treating "Doctor-sour" petroleum distillates to render the same "Doctor-sweet." No. 2,221,183. Clinton E. Dolbear to Philip Wiseman, P. Kenneth Wiseman and Clinton E. Dolbear, trustees.

Improved mineral oil composition comprising viscous mineral oil fraction having in admixture therewith minor proportion of dimercaptyl diethyl ether in amount sufficient to inhibit deleterious effect of oxidation on oil. No. 2,220,941. Robert C. Moran to Socony Oil Co., Inc.

Conversion of lower molecular weight hydrocarbons into higher molecular weight hydrocarbons. No. 2,221,165. Arthur R. Goldsby to The Texas Company.

Treatment of unsaturated hydrocarbon oils to remove penetrating disagreeable odor. No. 2,221,301. Herman B. Kipper.

In process of cleaning oil wells from organic deposits comprising paraffinic matter, the steps of introducing thereinto a mixture of an oxygen-containing organic reducing compound and an inorganic oxidizing compound causing heat generated by interaction of said compounds to melt said deposits. No. 2,221,353. Donald A. Limerick and Howard C. Lawton to Shell Development Co.

Method of renovating used oil and system containing same. No. 2,221,380. Wm. G. Horsch to Socony-Vacuum Oil Co., Inc.

Conversion of hydrocarbon oils into gasoline. No. 2,221,425. Robert F. Ruthruff to Standard Oil Co. (Ind.)

Method of desalting a water and salt-bearing petroleum. No. 2,221,-518. George A. Jennings to Alcorn Combustion Co.

Fractionation of hydrocarbon vapor mixtures. No. 2,221,702. Gerald Eaton to Gulf Oil Corp.

Reissue. Method treating hydrocarbon oils to form therefrom low-boiling hydrocarbons suitable for motor fuel. No. 21,625. Wayne E. Kuhn to The Texas Company.

Catalytic conversion process for cracking petroleum oil. No. 2,221,824. Charles W. Tyson to Standard Oil Development Co.

Fuel for compression ignition engines. No. 2,221,839. David Lipkin to The Atlantic Refining Co.

Method for solvent refining of motor fuels. No. 2,221,846. Wilbur B. Pings to E. I. du Pont de Nemours & Company.

Improved lubricating oil composition comprising lubricating oil containing small amount of hydrogenated phenanthrene homolog boiling in the range above 175° C. No. 2,221,953. Chester L. Read to Standard Oil Development Co.

The process of converting heavy hydrocarbon oils into gasoline by pyrolysis. No. 2,222,060. Maurice H. Arveson to Standard Oil Co.

Process for stabilization of copper treated oils. No. 2,222,122. Walter A. Schulze and Graham H. Short to Phillips Petroleum Company.

U. S. Chemical Patents
Off. Gaz.—Vol. 519, No. 5—Vol. 520, Nos. 1, 2, 3—p. 232

## U. S. Chemical Patents

**Off. Gaz.—Vol. 519, No. 5—Vol. 520, Nos. 1, 2, 3—p. 233**

Preparation and separation of aromatic hydrocarbons. No. 2,222,128. Cary R. Wagner to The Pure Oil Company.

Process for separation and recovery of individual mercaptans from a sour hydrocarbon oil. No. 2,222,170. Wallace A. Craig and Paul C. Rich to Richfield Oil Corp.

Apparatus and a process for the recovery of gasoline from cracked petroleum hydrocarbons. No. 2,222,276. Dale F. Babcock to E. I. du Pont de Nemours & Co.

Process for producing asphalt. No. 2,222,347. Earle W. Gard and Blair G. Aldridge to Union Oil Company of California.

Process for refining a low boiling hydrocarbon distillate. No. 2,222,400. Hohn G. Butz.

Process for refining lubricating oil stocks. No. 2,222,475. David G. Brandt to Power Patents Company.

Lubricant having superior rust-proofing properties consisting of light petroleum oil, about 2-10% fatty oil, and about 0.5-3.0% phosphatide. No. 2,222,487. Johan C. D. Oosterhout and William S. Quimby to The Texas Company.

### Pigments

Process transferring a pigment from an aqueous system to an organic vehicle immiscible with water. No. 2,219,395. John L. Moilliet to Imperial Chemical Industries, Ltd.

In the production of cadmium sulfide pigments the step comprising calcining the pigments in a calcination zone in an atmosphere which is at least partially reducing and produced by the volatilization of a volatile nitrate. No. 2,220,116. James J. O'Brien to The Glidden Co.

Method of making cadmium sulfide pigments. No. 2,220,117. James J. O'Brien to The Glidden Co.

Process producing white calcium sulfate pigment from hydrous calcium sulfate which is contaminated with iron. No. 2,220,289. Harold F. Saunders and Clovis H. Adams to The Sherwin-Williams Co.

Process for producing improved titanium oxide suspensions. No. 2,220,-966. Ignace J. Krchma to E. I. du Pont de Nemours & Co.

Production of improved pigments. No. 2,220,952. Harold C. Brill to E. I. du Pont de Nemours & Co.

Chlorine containing lacquer raw materials. No. 2,222,345. Alfred Blomer and Wilhelm Becker to I. G. Farbenindustrie Aktiengesellschaft.

Method of treating zinc sulfide ores to produce zinc sulfate and hydrogen sulfide. No. 2,222,468. Harold F. Saunders and Charles E. Penoyer to The Sherwin-Williams Co.

### Resins, Plastics, Etc.

Process for making composite materials including phenolic resin and vinyl resin including a polymerized vinyl ester. No. 2,219,447. Frazier Groff to Union Carbide and Carbon Corp.

A heat-stable resinous composition comprising a vinyl resin containing polymerized vinyl halide, and a stabilizing material comprising a member of the group consisting of organo-metallic aryl and mixed aryl-alkyl derivatives of lead and tin. No. 2,219,463. Victor Yngve, to Carbide and Carbon Chemicals Corp.

Interpolymer of acrylic nitrile, methyl methacrylate, and methacrylic amide. No. 2,220,033. Walter Bauer and Franz Esser to Rohm & Hass Company.

Phenol-cellulose resin. No. 2,220,062. Leon E. Champer, to The Chemical Foundation, Inc.

The process which comprises reacting formaldehyde, an ammonium salt, and a soluble sulfide in an aqueous solution of acid reaction to form a condensation product. No. 2,220,156. Ralph A. Jacobson to E. I. du Pont de Nemours & Co.

Method preparing oil soluble resinous material comprising reacting a petroleum solvent tar with a formaldehyde resinifying agent in presence of strong mineral acid catalyst to form a resinous product. No. 2,220,290. Alexander N. Sachanen and Pharez G. Waldo to Socony-Vacuum Oil Co., Inc.

Thermosetting molding composition comprising a formaldehyde-urea reaction product and a plasticizer which has a melting point of about 102° C. No. 2,220,337. Andrew W. Kassay to Plaskon Company, Inc.

Process producing synthetic resinous compositions, which comprises reacting a protein with an alkylene-imine, and jointly polymerizing reaction product with compound selected from group consisting of aromatic isocyanates and aromatic isothiocyanates. No. 2,220,441. Paul Esselmann and Josef Dusing to Walther H. Duisberg.

Method of welding thermoplastic materials. No. 2,220,545. Robert C. Reinhardt to The Dow Chemical Company.

A composition of matter comprising a polyvinyl acetal resin and diethylene glycol ditetrahydrofuroate as a plasticizer therefor. No. 2,221,031. Henry B. Smith to Eastman Kodak Company.

Polyvinyl acetal resin compositions containing butoxyethyl butoxyacetate. No. 2,221,032. Donald R. Swan to Eastman Kodak Company.

Polyvinyl acetal resin sheets containing di-isoamyl sulfone. No. 2,221,-033. Donald R. Swan to Eastman Kodak Company.

Polyvinyl acetal resin sheets containing amyl succinate. No. 2,221,034. Donald R. Swan to Eastman Kodak Company.

Polyvinyl acetal resin sheets containing a dialkyl maleate. No. 2,221,-035. Donald R. Swan to Eastman Kodak Company.

Polyvinyl acetal resin sheet containing ethoxyethyl maleate. No. 2,221,-036. Donald R. Swan to Eastman Kodak Company.

Preparation of lignin-phenol resin. No. 2,221,282. Leon E. Champer and Leo M. Christensen to The Chemical Foundation, Inc.

Plastic and process for producing same. No. 2,221,378. Fred J. Heckel.

Thiodiglycol-polycarboxylic acid condensation products. No. 2,221,418. Adolf Weihe to General Aniline & Film Corp.

Resinous composition, method of making the same, and article produced therefrom. No. 2,221,440. Robert E. Burnett to General Electric Company.

Resinous composition and method of making the same. No. 2,221,511. Edmond F. Fiedler and Alan F. Shepardson to General Electric Company.

Method producing a resin which is soluble in alcohol but substantially insoluble in light petroleum hydrocarbons. No. 2,221,540. Lucius C. Hall to Hercules Powder Co.

Process of molding polysulfide polymers. No. 2,221,650. Joseph C. Patrick to Thiokol Corp.

Process for preparation of urea-formaldehyde resin. No. 2,221,708. Theodore S. Hodgins and Almon G. Hovey to Reichhold Chemicals, Inc.

Thermo-setting acid-resistant resin products. No. 2,221,778. William R. Collings, Richard D. Freeman and Richard M. Upright to The Dow Chemical Company.

Process for preparing a thermo-setting acid-resistant resin product. No. 2,221,779. William R. Collings, Richard D. Freeman and Richard M. Upright to The Dow Chemical Company.

Moldable sheet composition and process of preparing same. No. 2,221,-945. Norman D. Hanson to Union Carbide and Carbon Corp.

Process of making artificial bodies from urea and formic aldehyde. No. 2,222,028. Hans Goldschmidt and Oskar Neuss; Marie I. Goldschmidt, administratrix of Hans Goldschmidt to American Cyanamid Co.

Nitrogenous condensation product and process of producing same. No. 2,222,208. Heinrich Ulrich to General Aniline & Film Corp.

A plastic composition essentially composed of a polyvinyl partial acetal resin combined with a plasticizer. No. 2,222,490. Harold F. Robertson to Carbide and Carbon Chemicals Corp.

Process for producing urea-formaldehyde-butanol reaction products. No. 2,222,506. Theodore S. Hodgins and Almon G. Hovey to Reichhold Chemicals, Inc.

### Rubber

Latex containing a small amount of arsenic trioxide and .2 to .75% ammonia, the amount of ammonia being insufficient of itself to preserve the latex. No. 2,219,469. Wallace E. Cake and Eugene M. McColm to United States Rubber Company.

Process of preparing insoluble elastic rubberlike composition. No. 2,219,661. Ernest Schnabel to Resistoflex Corp.

Bonding of rubber to metal. No. 2,220,460. Elwood L. Scholl, Amos W. Oakleaf and John D. Morron to United States Rubber Co.

An acid and moisture-resistant product comprising vulcanized hard rubber and as filler therefor mixture of very finely divided silica and glass, resulting from grinding of plate glass with sand as medium of abrasion. The mixture having been treated with acid and being of particle size to pass screen of 325 mesh. No. 2,220,759. Norbert S. Garbisch.

In a coagulant composition for effecting a latex deposit upon articles brought in contact therewith, a base emulsion comprising volatile solvent, water, oleic acid, ammonia, zinc acetate; and rubber cement added to said base emulsion; and pine resin added to said emulsion. No. 2,221,-214. George T. Buchanan.

Method preserving rubber companies treating rubber with a N,N' diaryl arylene diamine wherein at least one of said aryl groups contains an aralkyl substituent. No. 2,221,207. Robert L. Sibley to Monsanto Chemical Co.

Reclaimed rubber and method of producing the same. No. 2,221,490. Thomas Robinson to Lancaster Processes, Inc.

Rubberized belting and method of making the same. No. 2,221,984. Hunter McKay to Boston Woven Hose & Rubber Company.

Method vulcanizing rubber in presence of reaction product of an aldehyde with a material selected from group consisting of ammonium and amine salts of a carboxylic acid. No. 2,222,354. Joy C. Lichty to Wingfoot Corp.

Method preparing powdered or granulated rubber. No. 2,222,355. James A. Merrill to Wingfoot Corp.

### Textiles

Manufacture of staple fiber products from continuous filaments. Nos. 2,219,356-367. Henry Dreyfus and William Pool to Celanese Corp. of America.

Process creaseproofing textile fibers. No. 2,219,375. Gustave Widmer and Louis Klein to Rohm & Haas Company.

Method impregnating textile articles with a liquid. No. 2,219,663. Fritz Schuster.

Method for preparing thickeners for printing textile fabrics. Fred G. La Piana and Dave E. Truax to Stein, Hall and Company, Inc.

Process for rendering textile water-repellent and products therefrom. No. 2,220,856. Ernest Waltmann to Heberlein Patent Corp.

Viscose low in hemicellulose. No. 2,220,050. Johann J. Stoeckly abd Wolfgang Linnhoff to North American Rayon Corp.

A textile printing paste. No. 2,222,581. Henry Jenett to Interchemical Corp.

Method of decorating textile fabrics. No. 2,222,582. Henry Jenett to Interchemical Corp.

# *Abstracts of Foreign Patents*

**Collected from Original Sources and Edited**

## By E. L. Luaces, Chemical and Patent Consultant

To assist those making use of this summary, it might be well to comment briefly on the system used by each of these countries in reporting patents.

Canada grants the patent on the date of publication. Printed copies are not obtainable, but typewritten certified copies may be obtained at a cost averaging about five dollars each.

English "patents" here reported are known as *Complete Specifications Accepted*. They are printed for distribution at a cost of 1s. 1d. each. They are subject to opposition by interested parties for a period of two months from date of publication.

French patents are granted several months before publication. Allowed applications are open to public inspection on payment of a fee, but no copies may be purchased nor notes made from the original. Printed copies of specifications are available to public several months after issue at 10 francs each, plus postage.

Belgian patents are granted several months before publication. No printed copies are available, but photostat copies may be obtained at a cost of from 3.5 to 4.5 francs per page.

In this digest the latest available data will be published as obtained from original sources. It will be readily understood that present conditions bring about delays in transportation and for that reason the coverage will vary from month to month. We expect shortly to be able to begin publication of abstracts of German patents.

Present conditions make it impossible to obtain printed copies or photostats of French and Belgian patents, but this should shortly be corrected. We shall be glad to assist those interested in obtaining copies of Canadian and English patents. Your comments and criticism will be appreciated.

## CANADIAN PATENTS

### Granted and Published September 24, 1940.

Soluble stannite solution containing stannite and triethanolamine and having pH of less than 12.6. No. 391,424. William B. Stoddard and Julius Berlin.

Production of a textile material by dissolving non-cellulosic material and then impregnating with a water-soluble condensation product of formaldehyde. No. 391,436 (see also No. 391,437). Henry Dreyfus.

Weed exterminating composition consisting substantially of sodium chlorate 12.5 pounds, sodium tetraborate 15-25 pounds, caustic soda 3.2-5.2 pounds, and 10 gals. of water. No. 391,459. William J. Stephen.

Producing non-reactive heat treated carbon or lamp black by adsorbing fixed alkali on the black to give an "aqueous sludge pH" of from 6.0 to 9.0 and then converting the treated black to granular form. No. 391,492. William B. Wiegand.

Permanent magnet formed of a powdered alloy consisting of zirconium and nickel, iron, or cobalt, the zirconium being not less than 5% nor more than 40%, and the alloy being heat treated at about 345° C. No. 391,463. Alloys Limited (Peter P. Alexander).

Cellulose acetate-linoleate stearate of which the linoleate-stearate portion of the ester constitutes at least 25% thereof, the linoleyl being 4-19% of the ester. No. 391,377. Canadian Kodak Company, Ltd. (Charles R. Fordyce and Gordon D. Hiatt).

Precipitating acetylated cellulose from its reaction mixture by introducing into a bath consisting of acetic acid of 40-60% strength, and then washing the ester with hot water until a soft, non-horny product is obtainable on drying. No. 391,479. Canadian Kodak Company, Ltd. (Carl J. Malm).

Alkyl sulfate (textile wetting agent) having the formula: $R\text{-}O\text{-}SO_3\text{-}X$, wherein R is a branched chain octyl group and X is a cation. No. 391,481. Carbide and Carbon Chemicals, Ltd. (Joseph G. Davidson).

Method of employing carbon dioxide as fire extinguisher. No. 391,482. Cardox Corporation (Eric Geertz).

Parasiticidal composition comprising aqueous solution of sodium hypochlorite of about 0.01% to 0.1% strength. No. 391,483. Clorox Chemical Co. (Halma A. Tibbetts).

Method of condensing an aliphatic ketone with a diarylamine in presence of a hydronaphthalene while heating to temperature at which hydronaphthalene liberates active hydrogen for combination with the condensation product. No. 391,492. Dominion Rubber Company, Limited (Ludwig Meuser and Charles S. Dewey).

Making aliphatic ketone-diarylamine antioxidants by reacting a diarylamine in liquid form with an aliphatic ketone in vapor form. No. 391,493. Dominion Rubber Company, Limited (William F. Tuley, Roy S. Hanslick and Charles S. Dewey).

Hair rinse including one of the group consisting of phthalic acid, potassium acid phthalate, furoic acid, and soluble coal tar color. No. 391,499. Golden Glint Company, Inc. (Russell R. Frew).

Concentrating fluorspar ores by forming a pulp, adding a fatty acid fluorspar flotation reagent and quebrancho extract, agitating, and removing froth. No. 391,507. Mahoning Mining Company (Julius B. Clemmer and Carl O. Anderson).

Gel-forming, diarrhoea controlling product in its dry state which will form a gel when added to aqueous media and boiled, said prouct containing as its gel forming constituents pectin and agar-agar. No. 391,508. Mead Johnson & Company (Charles A. Tompkins).

Electrolytic cell. No. 391,513. Pomilio Corporation, Limited (Umberto Pomilio).

Gas expanded plastic comprising closed cells containing a non-oxidizing mixture of nitrogen and carbon dioxide. No. 391,517. Rubatex Products, Inc. (Dudley D. Roberts and Roger C. Bascom).

Laminated rubber hydrochloride structure, part being stretched and part cast. No. 391,532. Wingfoot Corporation (Ray P. Dinsmore).

Process for catalytic thermal dehydration of an aliphatic acid. No. 391,535. Henry Dreyfus.

Process for manufacturing highly acetylated cellulose. No. 391,550. Société des Usines Chimiques Rhône-Poulenc (Pierre Koetschet).

In producing salts of beta-methylcholine and its acyl derivatives, the steps of reacting propylene oxide with trimethylamine. No. 391,551. Merck & Co., Inc. (Georg Roeder).

Incorporating leuco vat dye esters in a transparent photographic layer and precipitating the esters with thiourea silver halide complexes to form stable compounds. No. 391,553. Ludwig Schinzel and Canadian Kodak Company, Ltd. (Ludwig Schinzel and Karl Schinzel).

### Granted and Published October 1, 1940.

Use of cellulose acetate propionate and urea as light polarizing materials. No. 391,584. Edwin H. Land.

Increase hardness of preshaped porous cellulosic objects by spraying with molten terpin hydrate. No. 391,586. Christopher Luckhaupt.

Improving corrosion resistance of surfaces by spraying thereon a mixture of siliceous substance and a metal both in powdered form. No. 391,587. Charles F. Lumb.

Preparing luminescent bodies by applying a solution of an acid of an element of the fifth group and a luminous substance to the surface of a glass body. No. 391,609. Canadian General Electric Company, Limited (Walter Dawihl, Otto Fritze and Alfred Ruttenauer).

Strain-free glass-to-metal seal comprising a glass which contains about 60% $SiO_2$, about 31% $B_2O_3$, about 6% $Na_2O$, and a complementary proportion of $Al_2O_3$ in combination with an alloy consisting essentially of about 41% Ni and 59% Fe. No. 391,613. Canadian General Electric Company, Ltd. (Albert W. Hull and Emmett E. Burger).

Sintered hard metal alloy consisting of a mixture of tungsten carbide, from 5-20% titanium carbide, from 6-12% of an auxiliary metal of lower melting point such as iron, nickel, cobalt, from 0.5-2% vanadium carbide, and from 0.5-2% molybdenum carbide. No. 391,616. Canadian General Electric Company, Ltd. (Walter Dawihl and Karl Schroter).

Sintered hard alloy consisting of about 1% vanadium carbide, about 0.5% molybdenum carbide, about 6% cobalt, balance tungsten carbide. No. 391,617. Canadian General Electric Company, Ltd. (Reinhard Chelius).

Retarder for plasters, etc., comprising a hydrolyzed protein, and a water-repellent associated therewith in excess of that amount derivable from the crude protein material hydrolyzed. No. 391,618. Canadian Gypsum Company, Limited (Nicholas S. Yanick).

Process of separating monovinylacetylene from higher polymers of acetylene. No. 391,621. Canadian Industries, Limited (Albert S. Carter).

Process for removing divinylacetylene from a liquid composition which comprises an oily acetone-soluble polymer of divinylacetylene. No. 391,622. Canadian Industries, Limited (Albert S. Carter).

Apparatus for polymerization of organic compounds at elevated temperatures. No. 391,623. Canadian Industries, Limited (Charles M. Fields).

Molded stiffened member for shoes comprising an absorptive base impregnated with a polymeric compound selected from acrylic acid, esters of acrylic acid, methacrylic acid, esters of methacrylic acid, interpolymers and derivatives thereof and a plasticizer. No. 391,624. Canadian Industries, Limited (Harry R. Dittmar).

Coated abrasive article comprising a layer of abrasive grain adhesively held to a flexible backing of fibrous glass. No. 391,635. The Carborundum Company (Norman P. Robie).

Process for preparing delustered synthetic fibre. No. 391,644. E. I. du Pont de Nemours & Co., Inc.

Flexible sheet material comprising a flexible fabric base and a synthetic linear condensation polymer capable of being formed into fibres showing by characteristic X-ray patterns orientation along the fibre axis. No. 391,645. E. I. du Pont de Nemours & Co., Inc.

7 9/29-32

# Foreign Chemical Patents

**Canadian, English and French—p. 37**

Process for the production of color photographs. No. 391,653. General Aniline & Film Corporation (Lothar Jakob and Bruno Wendt).

Alkaline detergent material containing water of crystallization in an amount which remains stable during storage, consisting of a partially hydrated compound of sodium phosphate and sodium carbonate. No. 391,657. The Griffiths Laboratories, Inc. (Lloyd A. Hall and Carroll L. Griffith).

Method of producing a homogeneous stable alkaline detergent product containing sodium borate and phosphate compounds in solution. No. 391,658. Griffith Laboratories, Inc. (Lloyd A. Hall).

Method of making mosaics from powdered metals. No. 391,659. Handy & Harman (Gregory J. Comstock).

Flexible base (paper, fabric) treated with a polymer of ethylene which is solid at normal temperatures. No. 391,662. Imperial Chemical Industries, Limited (Michael W. Perrin, John G. Paton and Edmond G. Williams).

Antiseptic package for bakery products containing a germicide which will emit free chlorine in the presence of moisture given off by said products. No. 391,666. The W. E. Long Company (Louis W. Haas and John W. Reed).

Processes for the manufacture of composite pigments. Nos. 391,671 to 391,673. Canadian Titanium Pigments, Limited (Hugh V. Alessandroni).

Anti-knock gasoline containing a small amount of a normally liquid mixture of copper compounds of methyl amino methylene acetone and ethyl amino methylene acetone. No. 391,683. Shell Development Company (Adrianus J. van Melsen and Pieter L. Stedehouder).

Apparatus for catalytically converting hydrocarbons. Nos. 391,685 and 391,688. Socony Vacuum Oil Company, Inc. (Thomas P. Simpson, John W. Payne, John A. Crowley, Jr., and Clark S. Teitsworth).

Process for effecting the conversion of hydrocarbons into those of the gasoline. No. 391,687. Socony-Vacuum Oil Company, Inc. (Thomas P. Simpson, John W. Payne, John A. Crowley,, Jr., and Clark S. Teitsworth).

Producing a starch hydrolysis product by subjecting a starch suspension to saccharification in presence of a molybdenum catalyst. No. 391,689. A. E. Staley Mfg. Co. (David P. Langlois).

Processing of titaniferous ores. No. 391,695. Vanadium Corporation of America (Holbert E. Dunn).

Processes for stabilizing organic esters of cellulose. Nos. 391,702 and 391,703. Camille Dreyfus (George W. Seymour).

Processing of titaniferous ores. No. 391,704. Carmela (or Mildred) Rees and John R. Davis (Charles P. Rees and John R. Davis).

Process for froth flotation of non-sulfide ores. No. 391,709. Canadian Industries, Limited (Samuel Lenher).

In electrodepositing metals, electrolyzing an aqueous solution containing a metal selected from nickel, cadmium, chromium, copper, gold, iron, lead, silver, tin, zinc and cobalt and an alkyl aromatic sulfonate of the benzene series containing at least 10 carbon atoms in the alkyl group. No. 391,717. Lawrence W. Flett.

Process for the manufacture of a porous elastic fabric containing latex rubber. No. 391,726. Fernand F. Schwartz and Marc A. Chavannes (Fernand F. Schwartz).

## ENGLISH COMPLETE SPECIFICATIONS

### Accepted and Published July 17, 1940.

Photographic emulsion. No. 522,997. Kodak, Ltd.

Automatic filtration of used oil. No. 523,146. V. L. Hunyadi and J. Koch.

Production of printed textile fabrics. No. 522,941. Interchemical Corporation.

Preparation of trisubstituted barbituric acid. No. 523,047. J. D. Riedel-E. de Haen, A. G.

Preparation of composite pigment. No. 523,148. Glidden Company.

Carbon blacks. No. 523. Imperial Chemical Industries, Limited.

Apparatus for testing gas. No. 522,942. Mine Safety Appliances Co.

Manufacture of non-metallic electric resistance materials. No. 523,051. Ges. zur Verwertung Chemisch-Technischer Verfahren.

Biological processes for the purification of liquids. No. 523,151. J. D. Griffin.

Production of composite fabrics. No. 523,152. Dunlop Rubber Co., Ltd.

Phosphate coating of iron or zinc or their alloys. No. 522,954. American Chemical Paint Co.

Process and apparatus for treating food products. No. 522,957. Crown Cork & Seal Co.

Separation of ice from concentrates when concentrating solutions by freezing out water. No. 522,962. Ges. fur Linde's Eismaschinen A. G.

Destructive distillation of carbonaceous materials. No. 523,006. J. L. Strevens, A. E. Waters and E. W. Brocklebank.

Manufacture of alkali metals by electrolysis. No. 523,008. E. I. du Pont de Nemours & Co.

Polymerization products and polymerization process. Nos. 522,981 and 522,982. Wingfoot Corporation.

Vulcanization of rubber. No. 522,983. Wingfoot Corporation.

Sensitizing photographic emulsions and manufacture of dyes therefor. No. 523,012. Kodak, Ltd.

Injection molding of thermoplastic materials. No. 523,013. Celluloid Corporation.

Manufacture of yeast. No. 523,010. International Yeast Co., Ltd.

Production of double fluorides of alkali metals and aluminum. No. 522,987. H. W. Heiser.

Manufacture of explosive compositions. No. 522,989. Imperial Chemical Industries, Limited.

Manufacture of azo dyestuffs. No. 523,035. Imperial Chemical Industries, Ltd.

Production of rubber vulcanization accelerators. No. 523,037. Monsanto Chemical Company.

Bactericidal and antiseptic preparations for human use. No. 523,107. J. F. Moseley.

Manufacture of cyano or thiocyana compounds. No. 523,109. J. R. Geigy A. G.

Polyvinyl chloride films. No. 523,110. I. G. Farbenindustrie A. G.

Removing salts from water. No. 523,111. I. G. Farbenindustrie A. G.

Aluminum alloys. No. 523,120. H. C. Hall.

Chewing gum. No. 523,122. Peter Paul, Inc.

Cementation of metals and alloys with beryllium. No. 523,071. Deutsche Gold und Silber Scheideanstalt vorm. Roessler.

Method of recovering zinc oxide and ferric oxide from filter dust, etc. No. 523,072. Ruhrstahl A. G.

Manufacture of unsaturated esters. No. 523,080. Imperial Chemical Industries, Ltd.

Production of butter. No. 523,082. Patentverwertungs Ges. Hermes.

Printing inks. No. 523,158. Interchemical Corporation.

Setting films of coating compositions containing a urea-formaldehyde resin. No. 523,159. Interchemical Corporation.

Inks for printing on porous papers such as newsprint. No. 523,181. L. Elion.

Polymerization of butadienes in aqueous emulsion. No. 523,130. I. G. Farbenindustrie A. G.

Method and apparatus for the filtration of cyanide solutions. No. 523,188. Merrill Co.

Method of making chlorinated rubber. No. 523,189. Hercules Powder Company.

Saccharification of cellulose to obtain sugar solutions suitable for alcohol fermentation. No. 523,190. M. Giordani and P. Leone.

Process for continuous fractional distillation. No. 523,139. Rheinmetall Borsig A. G.

Manufacture of cellulose esters. No. 523,191.

Apparatus for drying whey and other waste liquors. No. 523,091. C. O. Lavett.

## FRENCH PATENTS

### Granted January 19 and Published February 1, 1940.

Process for the removal of caffein from coffee. No. 854,459. Max Brunner & Co.

Process for salting viands. No. 854,516. A. Nietiedt.

Process for obtaining peptonated extracts from viands. No. 854,549. Forschungsgemeinschaft Dr. Kremers G. m. b. H.

Process for the preparation of yeast. No. 854,452. Troponwerke Dinklage & Co.

Saturator for the enrichment of liquids. No. 854,543. L. E. Grandchamp.

Process for dyeing vegetable fibres. No. 854,503. I. G. Farbenindustrie A. G.

Improvements in carbon dioxide fire extinguishers. No. 854,535. Cardox Corporation.

Process for production of anhydrous sodium hyposulfite. No. 854,450. I. G. Farbenindustrie A. G.

Preparation of alpha-chloro beta-alkoxybutyric aldehydes. No. 854,496. I. G. Farbenindustrie A. G.

Apparatus for producing oxygen from chemical products such as hydrogen peroxide with the aid of a catalyst. No. 854,514. I. G. Farbenindustrie A. G.

Process for the preparation of dyes. No. 854,534. Société pour l'Industrie Chimique a Bale.

Water-soluble azo dyes and intermediates used in their manufacture. No. 854,562. I. G. Farbenindustrie A. G.

Production of Diesel oils of low congealing point and high ketone index. No. 854,437. I. G. Farbenindustrie A. G.

Process for the manufacture of lubricant. No. 854,521. Standard Oil Development Company.

Improvements in synthetic resins. No. 854,447. Cie. des Meules Norton.

Vulcanizing apparatus. No. 854,524. David Bridge & Co., Ltd.

Automatic apparatus for chlorinating water under pressure. No. 854,482. R. Gresse.

Apparatus for the concentration of acids. No. 854,510 . Hercules Powder Company.

Process and apparatus for filtering liquids. No. 854,544. I. Wallquist.

Polymerization product. No. 854,435. Standard Oil Development Company.

Process for the preparation of cellular materials. No. 854,436. C. J. McKinney and J. S. Reid.

Regeneration of catalysts. No. 854,439. N. V. Internationale Hydrogeneerings Octrooien Mij.

Production of methacrylic polymerization products. No. 854,548. Rohm & Haas G. m. b. H.

### Granted January 24 and Published February 8, 1940.

Sulfitation of wines. No. 854,766. A. Nikolitch-Bertrand.

Process for utilization of zein. No. 854,741. Corn Products Refining Co.

Process for giving water-repellency to fibrous bodies. No. 854,788. I. G. Farbenindustrie A. G.

Process and apparatus for closing paper bags. No. 854,613. Verpackungsbedarf G. m. b. H.

Process of inhibiting surface oxidation of iron-chromium-aluminum alloys. Nos. 854,654 to 854,656. Ruhrstahl A. G.

Treatment of substances containing tin. No. 854,669. Aktiebolaget Industrimetoder.

Process for reduction of iron ores. No. 854,699. Fried. Krupp Grusonwerke A. G.

Pre-alloy for the production of magnesium alloys. No. 854,736. F. Christen.

Improvements in colored glass. No. 854,787. Corning Glass Works.

Production of vinyl esters from acrylic acid and its homologues. No. 854,616. Rohm & Haas G. m. b. H.

Separation of thiophenols of alkylphenols. No. 854,657. N. V. de Bataafsche Petroleum Mij.

Production of finely divided oxides. No. 854,658. Corning Glass Works.

Preparation of aliphatic amino-sulfonic acids. No. 854,740. I. G. Farbenindustrie A. G.

Improvements in the preparation of lignin. No. 854,750. Northwood Chemical Co.

Preparation of 4-chloro-5-nitro-1-naphthomethyl chloride. No. 854,799. I. G. Farbenindustrie A. G.

Manufacture of luminescent powders. No. 854,624. Ets. Claude, Paz & Silva.

Indicating dye for pH determinations. No. 854,695. F. Hellige & Cie.

Vat dyes of the anthraquinone series. No. 854,752. I. G. Farbenindustrie A. G.

Purification of animal and vegetable oils and greases. No. 854,568. Desmarais Freres.

Production of hydrocarbons from CO and H. No. 854,617. N. V. Internationale Kool-Waterstoffen Synthese Mij.

Process for removing solid substances from oils. No. 854,728. N. V. Internationale Hydrogeneerings Octrooien Mij.

Process for the treatment of hydrocarbons. No. 854,744. Standard Oil Development Company.

Artificial resins and their manufacture. No. 854,698. Société des Usines Chimiques Rhône-Poulenc.

Process for dyeing leather. No. 854,716. Rohm & Haas G. m. b. H.

Hydrogenation of organic substances. No. 854,626. Imperial Chemical Industries, Ltd.